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Introduction

Informed by *Literacy and Numeracy for Learning and Life* - The National Strategy to Improve Literacy and Numeracy among Children and Young People 2011-2020 and the School Self-evalutation Guidelines, this booklet contains practical examples of how teachers can use differentiated active learning methodologies, inquiry-based approaches to learning and ongoing assessment to enhance the key skills of literacy, numeracy and working with others.

According to the *Senior Cycle Key Skills Framework, NCCA, 2009,* "the ability to think critically and creatively, innovate and adapt to change, to work independently and in a team, and to be a reflective learner are prerequisites for life and for the workplace in the 21st century. In line with international trends and influenced by the Lisbon strategy and the OECD DeSeCo *(Defining and Selecting Key Competencies)* initiative, a framework of key skills has been developed as part of the curriculum and teaching and learning at senior cycle. In addition, these skills support the development and enhancement of the basic skills of literacy and numeracy which are crucial for learners to access the curriculum and for their future life chances.

Five key skills have been identified as central to teaching and learning across the senior cycle curriculum. These are information processing, being personally effective, communicating, critical and creative thinking and working with others. Many of the elements that make up these skills are already a feature of teaching and learning across subjects. The embedding of key skills in the curriculum will thus involve building on current practice but it also involves increasing attention to the skills and their potential for actively engaging learners. By embedding the key skills in the curriculum learners will be presented with a range of learning experiences and outcomes that will improve their present and future access to learning, their social interaction, their information and communication abilities and their ability to work collaboratively" (NCCA, 2009).

The Nature of Learning: Using Research to Inspire Practice (OECD, 2010) "is essential reading for all those interested in knowing what research has to say about how to optimise learning in classrooms, schools and other settings. The questions addressed for the OECD by leading researchers from North America and Europe include:

•   What do we know about how people learn?
•   How do young people's motivations and emotions influence their learning?
•   What does research show to be the benefits of group work, formative assessments, technology
     applications, or project-based learning and when are they most effective?
•   How is learning affected by family background?"

The full publication may be downloaded @ www.oecd.org/edu/ceri/50300814.pdf

A summary of this publication may be downloaded @ www.oecd.org/edu/ceri/50300814.pdf

Global Competency for an Inclusive World may be downloaded @
www.oecd.org/pisa/aboutpisa/Global-competency-for-an-inclusive-world.pdf

Key Skills of Junior Cycle

- Developing my understanding and enjoyment of words and language
- Reading for enjoyment and with critical understanding
- Writing for different purposes
- Expressing ideas clearly and accurately
- Developing my spoken language
- Exploring and creating a variety of texts, including multi-modal texts.

- Knowing myself
- Making considered decisions
- Setting and achieving personal goals
- Being able to reflect on my own learning
- Using digital technology to manage myself and my learning

- Using language
- Using number
- Listening and expressing myself
- Performing and presenting
- Discussing and debating
- Using digital technology to communicate

- Being healthy and physically active
- Being social
- Being safe
- Being spiritual
- Being confident
- Being positive about learning
- Being responsible, safe and ethical in using digital technology

BEING LITERATE

COMMUNICATING

MANAGING MYSELF

WORKING WITH OTHERS

KEY SKILLS

STAYING WELL

BEING CREATIVE

MANAGING INFORMATION & THINKING

BEING NUMERATE

- Developing good relationships and dealing with conflict
- Co-operating
- Respecting difference
- Contributing to making the world a better place
- Learning with others
- Working with others through digital technology

- Being curious
- Gathering, recording, organising and evaluating information and data
- Thinking creatively and critically
- Reflecting on and evaluating my learning
- Using digital technology to access, manage and share content

- Imagining
- Exploring options and alternatives
- Implementing ideas and taking action
- Learning creatively
- Stimulating creativity using digital technology

- Expressing ideas mathematically
- Estimating, predicting and calculating
- Developing a positive disposition towards investigating, reasoning and problem-solving
- Seeing patterns, trends and relationships
- Gathering, interpreting and representing data
- Using digital technology to develop numeracy skills and understanding

OIDEACHAIS AGUS SCILEANNA | DEPARTMENT OF EDUCATION AND SKILLS

NCCA
An Chomhairle Náisiúnta Curaclaim agus Measúnachta
National Council for Curriculum and Assessment

www.juniorcycle.ie

NEW STRATEGIES SHOULD BE INTRODUCED USING THE GRADUAL RELEASE OF RESPONSIBILITY MODEL OF TEACHING AND LEARNING

Role of the Teacher	Degree of Control	Role of the Student
Applying The teacher offers support and encouragement as necessary.		Students interact independently. They are in control of the conventions and content.
Guiding The teacher scaffolds help and provides support and corrective feedback.		Students do the activity with help from the teacher or other sources at pre-determined points.
Sharing The teacher provides the direction and invites the students to contribute.		Students contribute ideas and information. Decision making is negotiated between teacher and student.
Modelling The teacher demonstrates the processes used while thinking aloud.		Students participate by actively attending to the demonstrations.

Methodologies to Support an Integrated Approach to Teaching and Learning

Active Learning is generally defined as any instructional method that engages students in the learning process. Active learning requires students to do meaningful learning activities and think about what they are doing (meta-cognition) as individuals; pairs or structured groups. The core elements of active learning are student activity and engagement in the learning process. The benefits of active teaching and learning include: focus on the learner and learning; improved information retention; development of communication and higher order thinking skills, improved motivation and variety of learning opportunities. For a wide range of video vignettes of active learning strategies please go to **www.theteachertoolkit.com.** There are also many examples of **literacy, numeracy and ongoing assessment** strategies that promote active learning outlined in this booklet.

Collaborative Learning can refer to any instructional method in which students work together in small groups toward a common goal. The core element of collaborative learning is the emphasis on student **interactions** rather then on learning as a solitary activity.

Cooperative Learning can be defined as a **structured form of group work** where students pursue common goals while being assessed individually. The most common model of cooperative learning is that of Johnson, Johnson and Smith. This model incorporates five specific tenets, which are: individual accountability; mutual interdependence; face-to-face promotive interaction; appropriate practice of interpersonal skills and regular self-assessment of team functioning. While different cooperative learning models exist, the core element held in common is a focus on cooperative incentives rather than competition to promote learning.

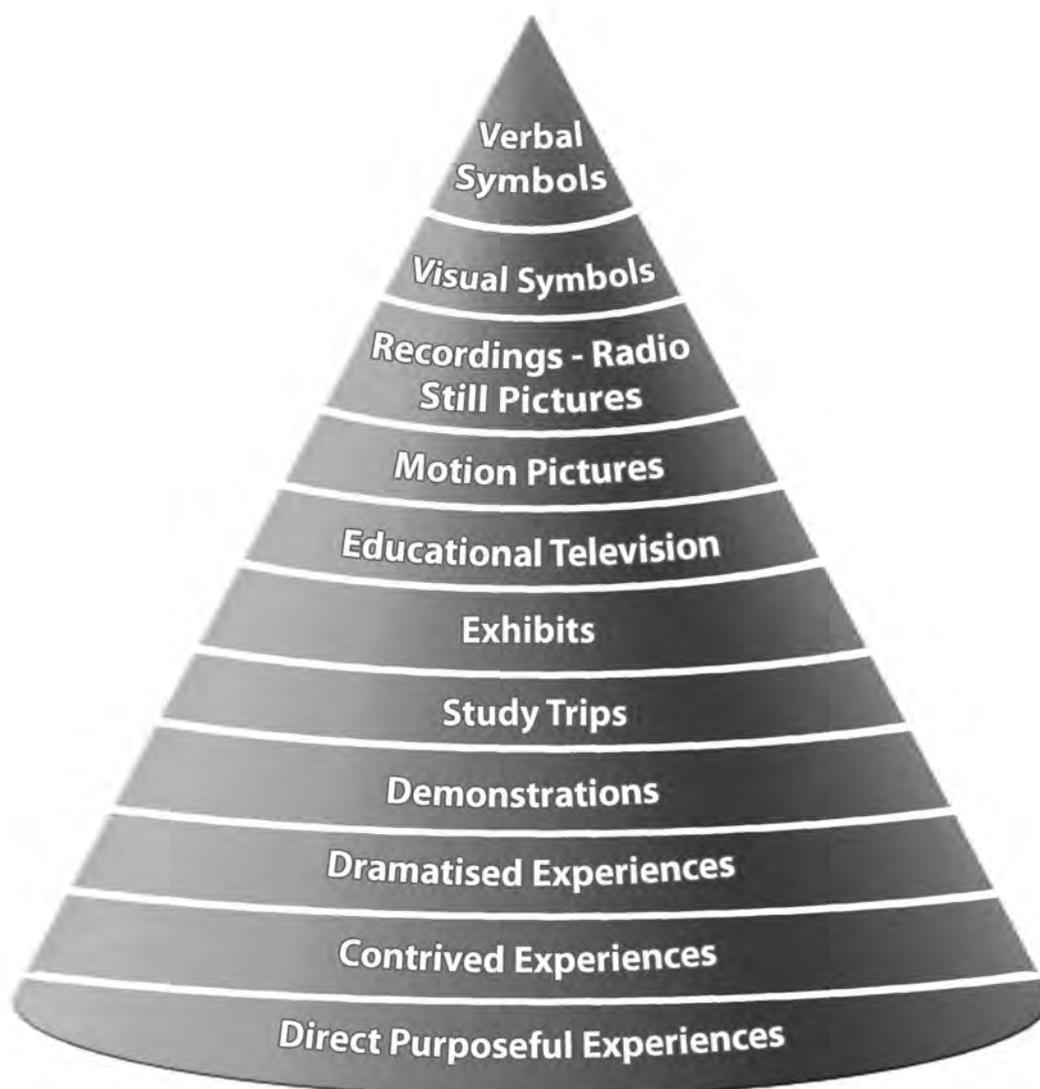***Inquiry-based Learning*** is an instructional method where relevant problems are introduced at the beginning of the instruction cycle and used to provide the context and motivation for the learning that follows. It is always active and usually (but not necessarily) collaborative or cooperative using the above definitions. IBL typcially involves significant amounts of self-directed learning on the part of the students.

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Dale's Cone of Experience

During the 1960s, Edgar Dale theorized that learners retain more information by what they "do" as opposed to what is "heard", "read" or "observed". His research led to the development of the Cone of Experience. The Cone was originally developed in 1946 and was intended as a way to describe various learning experiences. Essentially, the Cone shows the progression of experiences from the most concrete (at the bottom of the cone) to the most abstract (at the top of the cone).

When Dale researched learning and teaching methods he found that much of what we found to be true of direct and indirect (and of concrete and abstract) experience could be summarised in a pyramid or 'pictorial device'. He stated that the cone was not offered as a perfect or mechanically flawless picture to be taken absolutely literally. It was merely designed as a visual aid to help explain the interrelationships of the various types of audio-visual materials, as well as their individual 'positions' in the learning process.

It is important to note that Dale never intended the Cone to depict a value judgment of experiences; in other words, his argument was not that more concrete experiences were better than more abstract ones. Dale believed that any and all of the approaches could and should be used, depending on the needs of the learner.

Verbal
Symbols

Visual Symbols

Recordings - Radio
Still Pictures

Motion Pictures

Educational Television

Exhibits

Study Trips

Demonstrations

Dramatised Experiences

Contrived Experiences

Direct Purposeful Experiences

Learning Styles: What Does the Research Say?

In an influential publication in 2009, a group of cognitive psychologists revealed that there was a lack of empirical evidence supporting the concept of learning styles-based instruction and provided guidelines for the type of research design necessary to verify the learning styles hypothesis. Pashler et al (2009) found the contrast between the enormous popularity of the learning-styles approach within education and the lack of credible evidence for its utility striking and disturbing. They suggest that given the capacity of humans to learn, it seems especially important to keep all avenues, options, and aspirations open for our students, our children, and ourselves. They go on to say that the primary focus should be on identifying and introducing the experiences, activities, and challenges that enhance everybody's learning.

An article by Cuevas (2015) examined the literature since 2009 to ascertain whether the void has been filled by rigorous studies designed to test the matching hypothesis and identify interaction effects. Results revealed that the more methodologically sound studies have tended to refute the hypothesis and that a substantial divide continues to exist, with learning styles instruction enjoying broad acceptance in practice, but the majority of research evidence suggesting that it has no benefit to student learning, deepening questions about its validity. Cuevas (2015) suggests that just because someone self-reports that they prefer to learn a certain way does not mean that they will learn all concepts best if they are presented in that fashion, regardless of the specific content. Instead, the nature of the subject matter should determine how it is best taught and how it is best learned. Good teachers develop a variety of ways to present their content over the years and treat each student as a unique individual without pigeonholing them into unfounded categories. One question a reader might have is whether the learning styles hypothesis has by now been debunked. The answer at this point is 'not completely'. Additional research is always warranted, but correlational and theoretical research on the issue currently has little if any value (Cuevas, 2015).

See: **http://journals.sagepub.com/doi/abs/10.1177/1477878515606621** for full article and references.

Infographic on the Myths of Learning Styles is free to download @
http://elearninginfographics.com/the-myth-of-learning-styles-infographic/

Interactive Concept Map on Learning Theories is available @
http://hotel-project.eu/content/learning-theories-map-richard-millwood

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Multiple Intelligences: What Does the Research Say?

Proposed by Howard Gardner in 1983, the theory of multiple intelligences has revolutionized how we understand intelligence. The theory of multiple intelligences challenges the idea of a single IQ, where human beings have one central "computer" where intelligence is housed. Howard Gardner, the Harvard professor who originally proposed the theory, says that there are multiple types of human intelligence, each representing different ways of processing information (see next page).

The Difference Between Multiple Intelligences and Learning Styles
One common misconception about multiple intelligences is that it means the same thing as learning styles. Instead, multiple intelligences represents different intellectual abilities. Learning styles, according to Howard Gardner, are the ways in which an individual approaches a range of tasks. They have been categorized in a number of different ways -- visual, auditory, and kinesthetic, impulsive and reflective, right brain and left brain, etc. Gardner argues that the idea of learning styles does not contain clear criteria for how one would define a learning style, where the style comes, and how it can be recognized and assessed. He phrases the idea of learning styles as "a hypothesis of how an individual approaches a range of materials."

According to Gardner everyone has all eight types of the intelligences at varying levels of aptitude -- perhaps even more that are still undiscovered – however, all learning experiences do not have to relate to a person's strongest area of intelligence. For example, if someone is skilled at learning new languages, it doesn't necessarily mean that they prefer to learn through lectures. Someone with high visual-spatial intelligence, such as a skilled painter, may still benefit from using rhymes to remember information. **Learning is fluid and complex, and it's important to avoid labeling students as one type of learner. As Gardner states, "When one has a thorough understanding of a topic, one can typically think of it in several ways."**

Practices Supported by Research
Having an understanding of different teaching approaches from which we all can learn, as well as a toolbox with a variety of ways to present content to students, is valuable for increasing the accessibility of learning experiences for all students. To develop this toolbox, it is especially important to gather ongoing information about student strengths and challenges as well as their developing interests and activities they dislike. Providing different contexts for students and engaging a variety of their senses -- for example, learning about fractions through musical notes, flower petals, and poetic meter -- is supported by research. Specifically:

•   Providing students with multiple ways to access content improves learning (Hattie, 2011).

•   Providing students with multiple ways to demonstrate knowledge and skills increases engagement and learning, and provides teachers with more accurate understanding of students' knowledge and skills (Darling-Hammond, 2010).

•   Instruction should be informed as much as possible by detailed knowledge about students' specific strengths, needs, and areas for growth (Tomlinson, 2014).

See: **https://www.edutopia.org/multiple-intelligences-research** for full article and references.

Differentiation and Multiple Intelligences: Project Suggestions

Verbal/Linguistic	Logical/Mathematical	Bodily/Kinaesthetic	Musical/Rhythmic
Using language to present your ideas, to express your feelings or to persuade others	*Reasoning, logical thinking, handling mathematical problems*	*Feeling and expressing things physically, doing hands-on work*	*Creating and feeling a rhythm to express a mood, detecting and analysing musical themes*
• Prepare a report • Write an essay • Create a poem or recitation • Listen to a recording on or view a video on.. • Conduct an interview on.. • Label a diagram • Give directions for.. • Retell in your own words	• Create a pattern • Describe a sequence or process • Develop a rationale • Analyse a situation • Critically assess... • Classify, rank or compare • Interpret evidence • Create a timeline... • Design a game to show...	• Create a role play • Construct a model or representation • Develop a mime • Manipulate materials • Work through a simulation • Create actions for...	• Compose a rap, song or rhyme • Create a jingle to teach others • Listen to music selections about... • Write a poem • Select music or songs for a particular purpose

Visual/Spatial	Interpersonal	Intrapersonal	Naturalist
Creating and interpreting visual images, thinking in three dimensions	*Understanding the feelings, needs and purposes of others*	*Understanding your own interior thoughts and feelings in a very clear way*	*Understanding nature, seeing patterns in the way nature works, classifying things*
• Draw a picture • Create a mural or display • Illustrate an event • Make a diagram • Create a cartoon • Paint or design a poster • Create a graphic • Use colour • Design a graphic organiser • Create a collage with meaningful artefacts	• Work with a partner or group • Discuss and come to conclusions within your group • Solve a problem together • Survey or interview others • Dialogue about a topic • Use cooperative groups to do a group project • Project a character's point of view	• Think about and plan • Write in a journal • Write on a blog or class wiki • Review or visualise a way to do something • Make a connection with past information or experiences • Metacognitive moment • Keep track of... and comment on... • Reflect on a character and express his or her feelings	• Discover or experiment • Categorise materials or ideas • Look for ideas from nature • Adapt materials to a new use • Connect ideas to nature • Examine materials to make generalisations • Draw conclusions based on information • Predict • Label and classify

Adapted from Differentiated Instructional Strategies: One Size Doesn't Fit All, by Gayle H. Gregory and Carolyn Chapman, 2007

Carpet Patch

Differentiating the Curriculum: A Framework for Planning

C	**Curriculum Content**: the curriculum to be studied may be increased or decreased in terms of depth and complexity. Aspects of the curriculum may be sequenced in smaller units and presented in smaller steps	• What must the students know/be able to do? • What should they know/be able to do? • What could they know/be able to do?
A	**Activities:** teachers may vary difficulty level of the tasks and activities in the lesson.	
R	**Resources:** selection and/or creation of a variety of different texts and support materials for students.	
P	**Products from the lesson:** teachers may plan for students to produce different outputs from a lesson, according to the individual's abilities, interests and aptitudes.	
E	**Environment:** classroom might be set up to support more group or individualised work (work centres, computer assisted, resource based, peer tutoring).	
T	**Teaching Strategies:** adopt particular ways of teaching designed to address the needs of the students (explicit, direct form or instruction, differentiated questioning, revising, practicing, prompting, cueing, individual contracts etc.)	
P	**Pace:** vary the rate at which the teaching takes place, or the rate at which the students are required to work and produce outputs.	
A	**Amount of Assistance:** vary the amount of assistance or help given to individuals during a lesson. May encourage peer assistance and collaboration	
T	**Testing and Grading:** vary the ways of assessing student learning and modify grading to reflect effort and originality as well as standard achieved.	
C	**Classroom Grouping:** various ways of grouping students within the class to allow for different activities to take place with different amounts of teacher direction.	
H	**Homework Assignment:** some students may have homework that involves additional practice at the same level of difficulty, while others may require application of knowledge and extension.	

Westwood, P. (2003) Commonsense Methods for Children with Special Educational Needs, London:Routledge-Falme

Differentiation: Classroom Walkthrough Checklist

Note with an "X" where you would place yourself on the continuum between the various descriptors listed.

1. TEACHER'S FOCUS

Focuses on what is taught	Takes student needs into consideration	Student-focused teaching and learning

2. TEACHER'S ROLE

Directs learning	Monitors student progress and facilitates learning	Diagnoses student learning needs, then prescribes and facilitates learning experiences

3. STUDENT INDEPENDENCE

Little student independence in thought or action	Some independence with teacher guidance	Self-reliant, independent learners

4. STUDENT RESPONSIBILITY

Teacher assumes major responsibility	Individual student responsibility is assumed	Teacher creates a community that values collaboration, support, assistance

5. TASK MANAGEMENT

Preference is one task for all	Comfortable with multi-tasks	Confident with multi-tasks

6. ORGANIZATION OF TIME AND TASKS

Few prompts for what, when, how, what next	Sufficient prompts that lead to limited or irregular self-direction	Organized and explicit system for what, when, how, what next

7. ORGANIZATION OF STUDENT WORK

Few explicit systems for organizing and managing student work	Some systems provided but limited or irregular student follow-through	Purposeful, effective systems organizing and managing work

8. PROVIDING STUDENT FEEDBACK

Teacher feedback only	Teacher feedback, student self-evaluation	Teacher feedback, student self-evaluation, peer feedback

Heacox D., (2009:22) *Making Differentiation a Habit*, *How to Ensure Success in Academically Diverse Classroom*. Free Spirit Publishing Inc

Differentiated Instruction

Checklist of questions for teachers planning differentiated learning for their students

B   **Building Safe Environments**
- Do students feel safe to risk and experiment with ideas?
- Do students feel included in class and supported by others?
- Is there an emotional "hook" for the learners?
- Are there novel, unique and engaging activities to capture and sustain attention?
- Are "unique brains" provided for? (learning styles and multiple intelligences)

R   **Recognising and Honouring Diversity**
- Does the learning experience appeal to the learners' varied and multiple intelligences and learning styles?
- May the students work collaboratively and independently?
- May the students show what they know in a variety of ways?
- Does the cultural background of the students influence instruction?

A   **Assessment**
- Are pre-assessments given to determine readiness?
- Is there long enough time to explore, understand and transfer the learning to long-term memory?
- Do students have time to revisit ideas and concepts to connect or extend them?
- Is metacognitive time built into the learning process?
- Do students use log, journals, wikis or a VPL for reflection and goal setting?

I   **Instructional Strategies**
- Are the learning intentions clearly stated and understood by the learner?
- Will the learning be relevant and useful to the learner?
- Does the learning build on past experience or create a new experience?
- Does the learning relate to the real world?
- Are strategies developmentally appropriate and hands on?
- Are the teaching strategies varied to engage and sustain attention?
- Are there opportunities for projects, use of ICT, creativity, problems and challenges?

N   **Numerous Curriculum Approaches**
- Do students work alone, in pairs or in small groups?
- Are some activities adjusted to provide appropriate levels of challenge?
- Is pre-testing used for revision/enrichment?
- Are problems, enquiries and contracts considered?

Adapted from Differentiated Instructional Strategies: One Size Doesn't Fit All, by Gayle H. Gregory and Carolyn Chapman, 2007

An Integrated Approach to Learning, Teaching & Assessment

FREERICE.COM

For each answer you get right, we donate 10 grains of rice through the World Food Programme to help end hunger

SPEAK UP TO RICE UP

Thanks to word-of-mouth, Freerice is a well-known and well-played game with over a million registered players.

And, together, we have raised enough rice to feed millions of people. With over 2 billion people active online today, imagine what we could achieve if we all took time to "rice up" against hunger?

Here are some fun tools to help you share us.

BANNERS | POSTERS / FLYERS | MERCHANDISE | TEACHING MATERIAL | SOCIAL MEDIA

Subjects

HUMANITIES
- Famous Paintings
- Literature
- World Hunger
- Famous Quotations

ENGLISH
- English Vocabulary
- English Grammar

MATH
- Multiplication Table
- Basic Math (Pre-Algebra)

CHEMISTRY
- Chemical Symbols (Full List)
- Chemical Symbols (Basic)

LANGUAGE LEARNING
- German
- Spanish
- French
- Italian
- Latin

GEOGRAPHY
- World Landmarks
- Identify Countries on the Map
- World Capitals
- Flags of the world

SCIENCES
- Human Anatomy

TEST PREPARATION
- SAT®

Motivation
Students are rewarded with free rice for a 3rd world country

AfL
If you get a question wrong, it will show you the answer & then it will repeat the question later in the game

Differentiation
There are 60 different levels and students will be brought up and down automatically as they play

English Vocabulary — Change Subjects ▶

Correct! result = outcome

award means:

- ocean
- prize
- king's son
- gem

You have now donated 10 grains of rice.

Learn more ways to fight hunger

Level: 1 to 60 — Best Level: 1 — Change Level ▶ — Re-Start ▶

Ongoing Assessment

As part of their classroom work, students engage in assessment activities that can be either formative or summative in nature. Teachers assess as part of their daily practice by observing and listening as students carry out tasks, by looking at what they write and make, and by considering how they respond to, frame and ask questions. Teachers use this assessment information to help students plan the next steps in their learning. Periodically this assessment will be in more structured, formalised settings where teachers will need to obtain a snapshot of the students' progress in order to make decisions on future planning and to report on progress. This may involve the students in doing projects, investigations, case studies and/or tests and may occur at defined points in the school calendar.

Formative Assessment

Assessment is formative when either formal or informal procedures are used to gather evidence of learning during the learning process, and used to adapt teaching to meet student needs. This process permits teachers and students to collect information about student progress, and to suggest adjustments to the teacher's approach to instruction and the student's approach to learning. Assessment for learning covers all of the aspects of formative assessment but has a particular focus on the student having an **active role in his/her learning.**

Summative Assessment

Assessment is summative when it is used to evaluate student learning at the end of the instructional process or of a period of learning. The purpose is the summarise the students' achievements and to determine whether, and to what degree the students have demonstrated understanding of that learning by comparing it against agreed success criteria or features of quality.

Assessment OF Learning (Summative)	Assessment FOR Learning (Formative)
Happens after learning takes place	An integral part of learning process
Information is gathered by teacher	Information is shared with learner
Information is usually transferred into marks	Information is available on quality of learning
Looks back on past learning	Looks forward to the next stage of learning

An Integrated Approach to Learning, Teaching & Assessment

A balance between Assessment for Learning (formative assessment) and Assessment of Learning (summative assessment) is essential. Many assessment for learning strategies that are used as an integral part of the learning process can also be used as summative assessment tools if used after the leatning.

Evidence of learning may include:

- Quality of answers to verbal questions that demonstrate understanding and the use of key vocabulary.
- Participation in discussions and structured group activities.
- Collections of relevant cartoons, newspaper articles etc.
- Oral presentations that demonstrate an understanding of key vocabulary and concepts and their application to real life.
- Creation of digital content using Web 2.0 tools.
- Written answers that demonstrate an understanding of key vocabulary and concepts and a range of lower and higher order thinking and application to real life.
- Demonstration of an appreciation and understanding of case study materials.
- Creative solutions to problems and scenarios.
- Creation of new ideas and resources.
- Learning logs that demonstrate real reflection on what is learned and how it was learned.
    - **Where are** students **now** in their learning?
    - **Where are** students **going** in their learning?
    - **How** will students get to the **next point** in their learning?

Activities that support on-going assessment

- *Teachers share the learning intentions (explicit description of what a learner should know, understand and be able to do as a result of learning)* **and success criteria with students.**
- Activities designed to create a context of learning for the learning intentions.
- Feedback to be clear, concise, linked to the learning intention and success criteria in order to *move the learning forward.*
- Use questioning in the classroom to generate discussion and improve students' participation in their learning (teachers to use Bloom's Taxonomy prompts to ensure and promote a range of high and low order thinking).
- Explicit vocabulary instruction - pre-teach key words (including exam words) and concepts, semantic maps, print rich environment of student generated wordwalls etc.

- Comprehension strategies
    - Pre reading– KWL, KWHL, prediction/anticipation exercises
    - During reading – graphic organisers*, SQ3R exercises
    - After reading– 321, graphic organisers*
    -
- Co-operative learning strategies – Think/Pair/Share/Square and Placemat exercises (these strategies will also promote oral language development).
- Embedding ICT by student using free online web 2.0 tools to create their own resources to help them learn and present their work - KWL creator, Studystack, Quizlet, Animoto, Photostory.

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- "Media Watch" – assign students to watch out for articles, videos and cartoons relevant to the subject in both digital and broadsheet media.
- Writing strategies – blogs, reports, learning log, writing frames to scaffold written answers, use of Bloom's Taxonomy outcome verbs and stem questions to clearly indicate the level answers required for written questions, drafting, editing and re-drafting of written work, rubrics to inform self and peer-assessment.
- Rubrics designed by teachers and students for formative assessment of written and oral activities and presentations using digital tools.
- Student self-reflection – learning log, "purple pen", write a letter to self, circle time to share reflections, self and peer-assessment, prompt questions like "lets pause", "reflect on what and how you have learned".

*Graphic Organisers: ranking ladder, stair steps, chain of events, sequence charts, funnel, fishbone, brain droplets, cross classification chart, double Venn diagram, triple Venn diagram four corner organisers, tri pie, starburst, research grid.

NCCA Assessment Toolkit

http://www.juniorcycle.ie/Assessment/On-going-assessment

1. Learning intentions and success criteria	2. Feedback
3. Questioning	4. Self-reflection

Learning Outcomes
Learning outcomes are statements in curriculum specifications to describe the understanding, skills and values students should be able to demonstrate after a period of learning.

Learning Intentions
A learning intention for a lesson or series of lessons is a statement, created by the teacher, that describes clearly what the teacher wants the students to know, understand, and be able to do as a result of learning and teaching activities.

Success Criteria
Success criteria are linked to learning intentions. They are developed by the teacher and/or the student and describe what success *looks like*. They help the teacher and student to make judgements about the quality of student learning.

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Making the link between learning outcomes, learning intentions and success criteria

Here is an example of how a teacher developed learning intentions, success criteria and an assessment task linked to learning outcomes for Junior Cycle English. Further examples are available on www.curriculumonline.ie

Write a book review - 1st Year

Learning Outcomes

Oral Language

5. Deliver a short oral text, alone and/or in collaboration with others, using appropriate language, style and visual content for specific audiences and chosen purpose.

Reading

4. Use an appropriate critical vocabulary while responding to literary texts.

5. Engage in sustained private reading as a pleasurable and purposeful activity, applying what they have learned about the effectiveness of spoken and written texts to their own experience of reading.

Writing

4. Write competently in a range of text forms, for example, report, multi-modal text, review, blog, using appropriate vocabulary, tone and a variety of styles to achieve a chosen purpose for different audiences.

7. Respond imaginatively in writing to their texts showing a critical appreciation of language, style and content, choice of words, language patterns, tone, images.

Learning Intention

We are learning to read books for enjoyment, and to express that enjoyment through a well-constructed review of a chosen book.

Task

A **reading project** for first year students runs for 6 to 8 weeks. Students read from a list of prescribed books. Students are organised in reading groups (4/5 students in each group). Each group agrees the book to be read and reading takes place in class and at home. Four books are read in total by each group.

At the end of the group work the individual students choose a book they enjoyed and write a review. The review can be included in the student's portfolio of writing and can also be used as the basis for an oral presentation.

Success Criteria

• Shows understanding of the chosen genre or form
  - Knowledge of the text under review
  - Conveys enthusiasm for the text (or the opposite)
  - Uses references well without giving away too much
  - Adopts an appropriate critical stance
  - Makes a clear recommendation
• Expresses ideas fluently, imaginatively, and with control of expression
• Writing displays mechanical competence

Alternatively, these criteria could be expressed in student-friendly language, e.g.:

• I show a good knowledge of the book
• I convey my enthusiasm for the text (or show clearly the parts I don't like)
• I express my ideas fluently and choose the right words and phrases most of the time
• My writing is accurate with correct spelling and grammar

Learning Intentions and Success Criteria, NCCA, 2015, page 12

Literacy
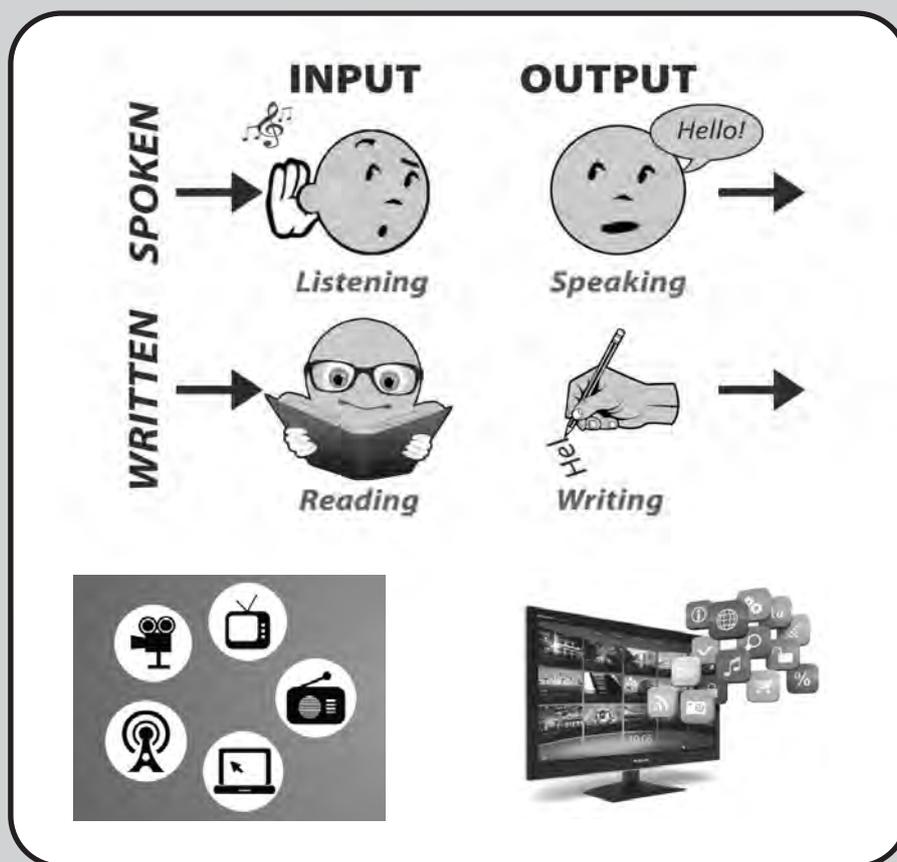
"Literacy includes the capacity to read, understand and critically appreciate various forms of communication including spoken language, printed text, broadcast media and digital media."

(DES, 2011)

Sample Cross-Curricular Active Learning Strategies

Oral literacy/speaking & listening - oral text types

- Listening & speaking posters
- Pair and small group work – think/pair/share/square, placemat exercise, jigsaw, role cards
- Dictation
- Questioning – use Bloom's Taxonomy outcome verbs, prompt questions and wait time
- Discussions/extended conversations
- Oral reports and presentations
- Storytelling and anecdotes
- Arguments and informal debates
- Interviews
- Meetings
- Interest talks - well briefed and prepared, guest speaker with accompanying worksheets
- Cloze tests – to consolidate vocabulary - **discuss** possible solutions/blank spaces
- Peer teaching

Comprehension/reading strategies

Pre reading
- KWL chart – build on prior knowledge
- Explicit Vocabulary Instruction (EVI) - keyword list/notebook, "Google notebook"
- Web 2.0 Tools for vocabulary development - freerice.com, studystack.com, instagrok.com, animoto.com, etc.
- Visual word square/semantic map
- Anticipation/prediction exercise
- Cloze tests – to consolidate vocabulary - **discuss** possible solutions/blank spaces
- School/student dictionary – model good practice & encourage students to use it

During reading
- Skim – get the gist
- Fix it up strategies: re-read, underline, read ahead, read back, look at pictures/diagrams for clues, break up words, use dictionary, read aloud, ask for help!
- Visualise – pictures, symbols
- Determining importance (selecting key words/concepts), summarising - highlighter/post-its
- SQ3R – to study in detail, survey, question, read, review, recall
- Graphic organisers – record main points information

After reading
- Cloze tests – **discuss** possible solutions/blank spaces
- Scan – finds specific information
- Mindmaps – recall/summarise, use pictures and colour
- Graphic organisers – recall main points information
- BUG – answer questions, **box** what you are asked to do, **underline** important words and **go** back over to make sure you answered the question

Writing

Genre
Note: check out the format used by other subject departments

- **Letter** - of application, thank you, complaint........
- **Recount:** Scene setting / re-telling events / closing
- **Report:** Describe the way things are / were
- **Procedure:** Recipe / instructions/ illustration / diagram
- **Explanation:** Series of logical steps to explain something
- **Persuasion:** Promote point of view – statement /argument / reiteration
- **Discussion:** Different view-points – statement one side /other side / recommendations in summary
- **E-mail/blog** – protocol and etiquette

Tools for effective writing
- Graphic organisers
- KWHL Charts
- Writing / Editing Checklists
- Bloom's Taxonomy / Prompt Questions
- Writing Frames
- Keywords
- Semantic Mapping
- Dictionary / Thesaurus
- Digital tools: Padlet, iNote, etc.
- Connectives

Writing Strategies
- Activation of prior knowledge
- Questioning / Bloom's Taxonomy / 5 W and a H
- Group writing tasks
- Create an audience (Hot seat / Ask the Expert, etc)
- Brainstormig
- Self-monitoring / Peer feedback strategies

For video vignettes and further template please go to the following links:
www.theteachertoolkit.com
http://www.adlit.org/strategy_library/
www.facinghistory.org/resource-library/teaching-strategies#side

Bloom's Taxonomy of Critical Thinking - *Sample Command Words*

	A		B	C	
1	2	3	4	5	6
Knowledge/ Remembering	**Comprehension/ Understanding**	**Application**	**Analysis**	**Synthesis/ Creating**	**Evaluation**
Count	Associate	Add	Analyse	Categorize	Appraise
Choose	Classify	Apply	Arrange	Combine	Assess
Define	Contrast	Build	Breakdown	Compile	Compare
Describe	Compare	Calculate	Combine	Compose	Conclude
Draw	Compute	Change	Design	Create	Contrast
Identify	Convert	Classify	Detect	Design	Criticize
Label	Defend	Construct	Develop	Devise	Critique
Match	Demonstrate	Complete	Diagram	Generate	Debate
Name	Discuss	Demonstrate	Differentiate	Invent	Deduce
Outline	Distinguish	Divide	Discriminate	Imagine	Determine
Quote	Estimate	Examine	Dissect	Modify	Disprove
Read	Explain	Graph	Examine	Order	Evaluate
Recall	Extend	Manipulate	Illustrate	Organize	Grade
Recite	Extrapolate	Modify	Infer	Plan	Interpret
Recognize	Generalize	Organise	Investigate	Rearrange	Judge
Record	Give examples	Prepare	Observe	Reconstruct	Justify
Select	Infer	Produce	Outline	Reorganize	Measure
State	Interpret	Present	Point out	Revise	Opinion
Write	Outline	Show	Relate	Summarize	Prove
5 Ws – who, what, where, why, when	Paraphrase	Solve	Relationship	Transform	Rank
	Predict	Use	Select	Specify	Rate
	Rewrite		Separate		Recommend
	Rephrase		Subdivide		Support
	Summarise		Utilize		Test

Pease note: Some words can be used as an outcome verb in more than one level depending on the context

Bloom's Taxonomy of Critical Thinking - *Sample Questions*

1. Knowledge
- What happened after . . . ?
- How many . . . ?
- Define
- Who was it that . . . ?
- Can you name the . . . ?
- Describe what happened at . . . ?
- Can you tell why . . . ?
- Find the meaning of . . . ?
- What is . . . ?
- Which is true or false . . . ?

2. Comprehension
- Can you write in your own words . . . ?
- Can you write a brief outline . . . ?
- What do you think might happen next . . . ?
- Who do you think . . . ?
- Can you distinguish between . . . ?
- What differences exist between . . . ?
- Can you provide an example of what you mean . . . ?
- Can you provide a definition for . . . ?

3. Application
- Do you know another instance where . . . ?
- Could this have happened in . . . ?
- Can you group by characteristics such as . . . ?
- What factors would you change if . . . ?
- Can you apply the method used to . . . ?
- What questions would you ask of . . . ?
- From the information given, can you develop a set of instructions about
- Would this information be useful if you had a . . . ?

4. Analysis
- Which events could have happened . . . ?
- How was this similar to . . . ?
- What do you see as other possible outcomes?
- Why did . . . changes occur?
- Can you compare your . . . with that presented in . . . ?
- Can you explain what must have happened when . . . ?
- How is . . . similar to . . . ?
- What are some of the problems of . . . ?
- Can you distinguish between . . . ?

6. Synthesis
- Can you design a . . . to . . . ?
- Can you see a possible solution to . . . ?
- Why don't you devise your own experiment to . . . ?
- What would happen if . . . ?
- How many ways can you . . . ?
- Can you create new and unusual uses for . . . ?
- Can you develop a proposal which would . . . ?

6. Evaluation
- Is there a better solution to . . . ?
- Can you defend your position about . . . ?
- Do you think . . . is a good or a bad thing?
- How would you have handled . . . ?
- What changes to . . . would you recommend?
- How could this be applied to . . . . ?
- How would you feel if . . . ?
- How effective is . . . ?
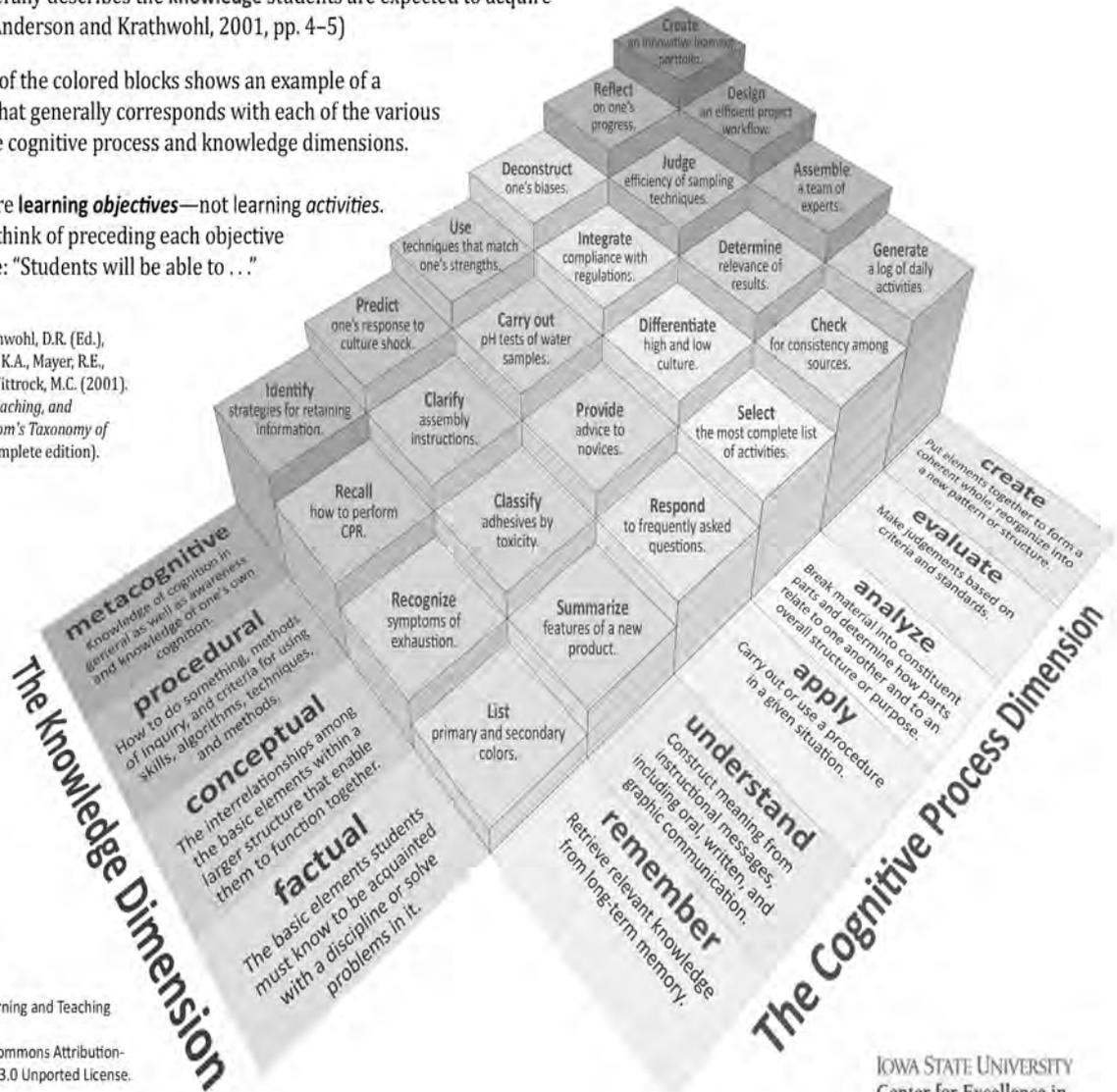- What do you think about . . . ?

A statement of a **learning objective** contains a verb (an action) and an **object** (usually a noun).

- The verb generally refers to [actions associated with] the intended cognitive process.

- The object generally describes the knowledge students are expected to acquire or construct. (Anderson and Krathwohl, 2001, pp. 4–5)

In this model, each of the colored blocks shows an example of a learning objective that generally corresponds with each of the various combinations of the cognitive process and knowledge dimensions.

Remember: these are **learning** *objectives*—not learning *activities*. It may be useful to think of preceding each objective with something like: "Students will be able to . . ."

*Anderson, L.W. (Ed.), Krathwohl, D.R. (Ed.), Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., & Wittrock, M.C. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives* (Complete edition). New York: Longman.

Create
an innovative learning portfolio.

Reflect on one's progress.

Design an efficient project workflow.

Deconstruct one's biases.

Judge efficiency of sampling techniques.

Assemble a team of experts.

Use techniques that match one's strengths.

Integrate compliance with regulations.

Determine relevance of results.

Generate a log of daily activities.

Predict one's response to culture shock.

Carry out pH tests of water samples.

Differentiate high and low culture.

Check for consistency among sources.

Identify strategies for retaining information.

Clarify assembly instructions.

Provide advice to novices.

Select the most complete list of activities.

Recall how to perform CPR.

Classify adhesives by toxicity.

Respond to frequently asked questions.

Recognize symptoms of exhaustion.

Summarize features of a new product.

List primary and secondary colors.

metacognitive
Knowledge of cognition in general as well as awareness and knowledge of one's own cognition.

procedural
How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods.

conceptual
The interrelationships among the basic elements within a larger structure that enable them to function together.

factual
The basic elements students must know to be acquainted with a discipline or solve problems in it.

The Knowledge Dimension

create
Put elements together to form a coherent whole; reorganize into a new pattern or structure.

evaluate
Make judgements based on criteria and standards.

analyze
Break material into constituent parts and determine how parts relate to one another and to an overall structure or purpose.

apply
Carry out or use a procedure in a given situation.

understand
Construct meaning from instructional messages, including oral, written, and graphic communication.

remember
Retrieve relevant knowledge from long-term memory.

The Cognitive Process Dimension

Model created by: Rex Heer
Iowa State University
Center for Excellence in Learning and Teaching
Updated January, 2012
Licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.
For additional resources, see:
www.celt.iastate.edu/teaching/RevisedBlooms1.html

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Learning and Teaching

Sample Key Examination Words

Term	Explanation
Analyse	Examine in detail and/or break down into components.
Assess	Describe the positives and negatives, identify the importance of.
Calculate	Find out by way of mathematical formula or numerical data.
Compare	Show the similarities and differences between.
Contrast	Show the differences between.
Criticise/Critique	Point out weaknesses as well as strengths.
Define	Give the precise meaning of.
Derive	Work out from basic principles.
Describe	Give the details of properties, events, processes etc.
Discuss	Examine or describe in detail. Make arguments for and against.
Distinguish	Point out the differences.
Draw	Make a picture or diagram.
Evaluate	Discuss and make a judgement on.
Examine	Take apart and describe a concept in great detail.
Explain	Make clear in a detailed manner.
Identify	Show you recognise.
Illustrate	Give examples including figures, diagrams or examples
Interpret	Explain, comment on and pass judgement.
Justify	Give reasons to support the statement.
List	Provide parts, reasons or qualities in itemised point form.
Prove (or disprove)	Give evidence.
Relate	Show the links, connections and associations.
Review	Comment on the main aspects of a subject.
Show	Explain with example, diagram or chart.
State	Write briefly without further comment.
Suggest	Give possible reasons and ideas.
Summarise (outline)	Give the key points without details.
Trace	Show the steps or stages to be followed.

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KWHL

Pre-reading comprehension & Assessment for Learning (AfL) strategy

K	W	H	L
What do I know about this concept/topic?	*What do I want know about this concept/topic?*	*How do I find out more about this concept/topic?*	*What have I learned about this concept/topic?*

*KWL creator is available @ **tinyurl.com/kwlcreator***

Keywords to Know

Subject:_____ **Date Begun:**_____

Topic: _____ **Date Completed:**_____

Directions: *Look at your list of keywords for this topic and decide in which column you want to write each word.*

I don't know the word at all	I've seen or heard the word but I don't know the meaning	I think I know the meaning	I know a meaning

As you learn more about the topic you can move words across to the right hand column.

PDST

Latin and Greek Roots and Affixes (Prefixes and Suffixes)

Familiarity with Greek and Latin roots, as well as prefixes and suffixes, can help students understand the meaning of new words.

Roots

A basic word to which affixes (prefixes and suffixes) are added is called a *root word* because it forms the basis of a new word. For example fear is a root word and less is a suffix. Put them together to form a new word fearless.

Affixes (Prefixes and Suffixes)

Many English words are formed by taking basic words and adding combinations of prefixes and suffixes to them.

When affixes are added to the beginning of roots or root words, they are called *prefixes*. For example, the most common prefix is *un-*, which meant *not* or *opposite of*. If you add *un-* to the word *happy*, the new word becomes *unhappy*, which means *not happy*.

When affixes are added to the end of roots or root words, they are called *suffixes*. The most common suffixes are -*s* and -*es*, which mean more than one (or the plural) of the word. Adding -*es* to *wish*, changes the meaning of the word to *more than one wish*.

Common Latin Roots

Latin Root	Definition	Example	Other Examples
ambi	both	ambiguous, ambidextrous	
aqua	water	aquarium, aquamarine	
aud	to hear	audience, audition	
bene	good	benefactor, benevolent	
cent	one hundred	century, percent	
circum	around	circumference, circumstance	
contra/counter	against	contradict, encounter	
dict	to say	dictation, dictator	
duc/duct	to lead	conduct, induce	
fac	to do; to make	factory, manufacture	
form	shape	conform, reform	
fort	strength	fortitude, fortress	
fract	break	fracture, fraction	
ject	throw	projection, rejection	
jud	judge	judicial, prejudice	
mal	bad	malevolent, malefactor	
mater	mother	maternal, maternity	
mit	to send	transmit, admit	
mort	death	mortal, mortician	
multi	many	multimedia, multiple	
pater	father	paternal, paternity	
port	to carry	portable, transportation	
rupt	to break	bankrupt, disruption	
scrib/script	to write	inscription, prescribe	
sect/sec	to cut	bisect, section	
sent	to feel; to send	consent, resent	
spect	to look	inspection, spectator	
struct	to build	destruction, restructure	
vid/vis	to see	televise, video	
voc	voice; to call	vocalize, advocate	

PDST

Common Greek Roots

Greek Root	Definition	Example	Other Examples
anthropo	man; human; humanity	anthropologist, philanthropy	
auto	self	autobiography, automobile	
bio	life	biology, biography	
chron	time	chronological, chronic	
dyna	power	dynamic, dynamite	
dys	bad; hard; unlucky	dysfunctional, dyslexic	
gram	thing written	epigram, telegram	
graph	writing	graphic, phonograph	
hetero	different	heteronym, heterogeneous	
homo	same	homonym, homogenous	
hydr	water	hydration, dehydrate	
hyper	over; above; beyond	hyperactive, hyperbole	
hypo	below; beneath	hypothermia, hypothetical	
logy	study of	biology, psychology	
meter/metr	measure	thermometer, perimeter	
micro	small	microbe, microscope	
mis/miso	hate	misanthrope, misogyny	
mono	one	monologue, monotonous	
morph	form; shape	morphology, morphing	
nym	name	antonym, synonym	
phil	love	philanthropist, philosophy	
phobia	fear	claustrophobia, phobic	
photo/phos	light	photograph, phosphorous	
pseudo	false	pseudonym, pseudoscience	
psycho	soul; spirit	psychology, psychic	
scope	viewing instrument	microscope, telescope	
techno	art; science; skill	technique, technological	
tele	far off	television, telephone	
therm	heat	thermal, thermometer	

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Common Prefixes

Prefix	Definition	Example	Other Examples
anti-	against	anticlimax	
de-	opposite	devalue	
dis-	not; opposite of	discover	
en-, em-	cause to	enact, empower	
fore-	before; front of	foreshadow, forearm	
In-, im-	in	income, impulse	
in-, im-, il-, ir-	not	indirect, immoral, illiterate, irreverent	
inter-	between; among	interrupt	
mid-	middle	midfield	
mis-	wrongly	misspell	
non-	not	nonviolent	
over-	over; too much	overeat	
pre-	before	preview	
re-	again	rewrite	
semi-	half; partly; not fully	semifinal	
sub-	Under	subway	
super-	above; beyond	superhuman	
trans-	across	transmit	
un-	not; opposite of	unusual	
under-	under; too little	underestimate	

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Common Suffixes

Suffix	Definition	Example	Other Examples
-able, -ible	is; can be	affordable, sensible	
-al, -ial	having characteristics of	universal, facial	
-ed	past tense verbs; adjectives	the dog walked, the walked dog	
-en	made of	golden	
-er, -or	one who; person connected with	teacher, professor	
-er	more	taller	
-est	the most	tallest	
-ful	full of	helpful	
-ic	having characteristics of	poetic	
-ing	verb forms; present participles	sleeping	
-ion, -tion, -ation, -ition	act; process	submission, motion, Relation, edition	
-ity, -ty	state of	activity, society	
-ive, -ative, -itive	adjective form of noun	active, comparative, sensitive	
-less	without	hopeless	
-ly	how something is	lovely	
-ment	state of being; act of	contentment	
-ness	state of; condition of	openness	
-ous, -eous, -ious	having qualities of	riotous, courageous, gracious	
-s, -es	more than one	trains, trenches	
-y	characterized by	gloomy	

Related words

The word/concept looks like this

Definition

The word/concept in a sentence

Anticipation Exercises

Are advance organizers that can be used to activate and assess students' prior knowledge, focus reading, and motivate reluctant readers by stimulating their interest in the topic.

(Dean, Hubbell, Pitler, & Stone, 2012)

How to use an Anticipation Exercise

1. Identify the major concepts that you want students to learn from reading. Determine ways these concepts might support or challenge students' beliefs.

2. Create four to six statements that support or challenge the students' beliefs and experiences about the topic under study. The statements can address important points, major concepts, controversial ideas, or misconceptions.

3. Ask students to react to and formulate a response to each statement and be prepared to defend their opinions. Students can work in groups if the subject matter is fairly complex, or you can ask students to fill in their answers on their own.

4. Discuss each statement with students before they read the material. Ask one student from each side of the issue (for/against, agree/disagree) to explain and justify his or her response.

5. Have students read the selection with the purpose of finding evidence that supports or refutes their responses on the guide.

6. After students finish reading the selection, have them confirm their original responses, revise them, or decide what additional information is needed. Encourage students to rewrite any statement that was not true in a way that makes it true.

(Urquhart and Frazee, 2012)

Anticipation Exercise

Topic:

Name: **Date:** **Score:** **Before:** **After:**

	Statement	Agree	Disagree	Evidence
1				
2				
3				
4				
5				
6				
7				
8				

Agree Disagree

Instructions: Guess answers, read passage/watch video, answer again, compare results before and after

New Word	Meaning

SQ3R

Survey	Look at the cover, title, headings, pictures, first & last paragraph. What do you know about this topic already?
Question	Ask yourself what is this about? What do I need to know? Are there any questions I have to answer? Is there specific information I must find out? What evidence is there for points made in the text?
Read	Read the passage carefully. Identify the main ideas and details.
Review	Reread the parts you think are important and any parts you are not sure of. Note key points and summarise them.
Recall	This is done when the book is closed. Have the questions been answered? Remember the keywords and main points. Tell your classmate.

MAIN IDEA

Supporting Details

1

2

3

3 2 1

3	Things I Found Out

2	Interesting Things

1	Questions I Still Have

PDST

How To Mind Map

- EQUIPMENT
  - HIGHLIGHTERS
  - FINE TIP TEXTAS
  - THICK TIPS
  - PENCILS
- USE COLOUR
  - WHY?
    - SEPARATES OUT THE IDEAS
    - HIGHLIGHT SIMILAR IDEAS
    - FUN
    - MORE INTERESTING
- CENTRAL IMAGE
  - COLOURFUL
  - SIMPLE
  - FUN
  - FIRST IMAGE THAT JUMPS TO MIND
- Computer Versus Hand Drawn
  - vs
  - Computer Downsides
    - May Restrict You — Why can't I add a branch?
    - Slows down the creative process
  - PAPER BENEFITS
    - Easier to follow and allows more freedom
- CURVE YOUR BRANCHES
  - WHY?
    - STRAIGHT LINES ARE BORING
    - MORE INTERESTING FOR YOUR BRAIN
  - THICK LINES TO THIN LINES
- = 1000 WORDS
- DRAW PICTURES
  - WE THINK IN PICTURES (NOT WORDS) — Don't think of a monkey
  - EXAGGERATED CRAZY IMAGES WORK BEST
  - DOESN'T NEED TO BE A WORK OF ART
- PAPER
  - USE
    - A4 OR A3
  - AVOID
    - TURN THE SHEET LANDSCAPE ORIENTATION
    - LINED PAPER
    - SMALL SHEETS — A5

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Using Writing Frames

Students need support in developing confidence in the different genres. Writing frames can help students structure their writing. They supply students with the outline, the connectives, which will knit the particular piece of writing. They also supply students with the logical sequence of a piece of writing. The idea is that you give the student a frame for whatever genre they need to write in. Ideally you tailor the frame to the particular exercise topic they are writing about.

The sentence stems can be written into their copies and they work in pairs to develop the text further. Negotiation around the text helps develop a fluid piece of writing.

Step One: Teacher Demonstration
The teacher models writing a piece of text in a particular genre. The teacher talks out loud to illustrate to the students what's involved in shaping their work. Initially, the teacher may need to do all of the writing. Wall charts can be useful at this stage.

Step Two: Teacher and Student together
The teacher writes with the students. The teacher does all the hard parts and is always on hand. All research shows that students learn more effectively when supported by an expert

Step Three: Students on their own with Writing Frames
The students should write in pairs with the support of a writing frame in whatever genre they are using. The frame should be tailored to the topic / task at hand. The students eventually produce a best copy as a result of working together. The teacher continues to support if necessary.

Step Four: Independence
The students should write independently once they feel confident.

The following are examples of the six frames mentioned – more are contained in the Appendix (pages 87-91). They can be adapted to suit any topic. The frames are made up of sentence stems **not questions.**

The writing frames are a development of the work of Vygotsky, L. (1978)
Mind in Society: the development of higher psychological processes
and are adapted from the work of Lewis, M. & Wray, D. (1997).

In Short...

Step 1
Teacher demonstration

Step 2
Teacher and students together

Step 3
Students supported by frame

Step 4
Independent writers

6

Between The Lines

Recount Writing Frame

Topic _____   Subject _____

Date: _____   Name: _____

I knew already that _____

And _____

I also just found out that _____

I also found that _____

As well as _____

The best that I learned was _____

Genre	Characteristics	Subject
Recount	To re-tell what happened in logical progression. To state prior knowledge of a given topic and to list down what is now known following the investigation of the topic.	All

6

Between The Lines

Explanation Writing Frame

Name: _____   Date: _____

Subject: _____   Topic: _____

I want to explain why _____

The main reason is _____

Another reason is _____

A further reason is _____

It is also thought that _____

Genre	Characteristics	Subject
Writing an Explanation	State what is to be explained and give several reasons.	Science, Maths, ESS, Materials Technology, Technology, Geography, CSPE, History

Instruction Writing Frame

Topic: _____   Subject: _____

Name: _____   Date: _____

When we _____

First we _____

Then we _____

After that we _____

Finally we _____

Genre	Characteristics	Subject
Writing Procedure	Statement – e.g. *Making a kite* List materials / equipment List steps – usually chronological Include diagram (usually).	Home Economics, Materials Technology – wood and metal Geography, ESS, Technology, ICT

6 Between The Lines

Persuasion Writing Frame

Topic: _____   Subject: _____

Date: _____   Name: _____

I think that _____

Because _____

Another reason I think this is _____

_____

Furthermore _____

Moreover _____

Because _____

I have shown that _____

Writing frames for other genres

Genre	Characteristics	Subject
Persuasion	Putting forward one point of view A position is stated The back-up arguments given Re-statement of position In summary.	History, Religion, CSPE, ESS, English, SPHE

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Possible Connectives for Writing Tasks

To indicate order...	To infer...	To reformulate...
To begin with Next Firstly, Secondly, etc. On second thoughts In conclusion Finally In spite of all	In other words In that case Otherwise This implies Frankly	In other words That means That is to say I mean Another way of stating this is Another way of putting it is It would be better to say
To express concession... Although Even if Even though Besides Anyhow, anyway In any case At any rate	**To refer to...** With regard to With reference to Referring to As to, as for According to the latter / the former	**To compare to...** Likewise Both Whereas While the first might indicate Similarly As for Equally As well as
To express reason / purpose... Therefore That is why For this reason Hence Because So Since As On account of So that	**To express place and space...** On the right To the left Nearby Between Among Here / there / where In the distance Straight ahead In front of / behind	**To add an idea...** Moreover Furthermore Also And Similarly Likewise Too Equally In the same manner Besides In addition to
To express condition or conse-quence... If Unless Suppose that In case of Providing that On condition that Consequently Hence Thus Accordingly As a result It follows that	**To express opposition...** But However Nevertheless Otherwise On the other hand On the contrary Yet Still Maybe Perhaps Instead Except for Despite	**To express time...** When Before / After Now While Since As long as / As soon as No sooner than Subsequently Eventually Initially Previously Recently Meanwhile Lately At last From now on Time and again Often Afterwards

Adapted from English on the Web

PDST

Numeracy & Being Numerate

" YOU WERE DOING 35.001 IN A 35 MILE ZONE..."

Things to Consider

1. **Definition of Numeracy**

2. **Cross-Curricular Numeracy**

3. **Numeracy in Context / Subject Area**

4. **A Co-ordinated Approach to Percentages**

5. **Mathematical Language**

6. **Print Rich Environment**

7. **Estimation Strategies**

8. **Problem Solving Strategies**

9. **Embedding ICT**

www.pdst.ie/node/4434

Report on Computational Thinking available @
https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/developing-computational-thinking-compulsory-education-implications-policy-and-practice

Numeracy

Numeracy is NOT LIMITED to the ability to use numbers, to add, subtract, multiply and divide.

Numeracy involves being able to:

- think and communicate mathematically;
- make sense of data (gathering, representing and interpreting);
- see and understand patterns and trends;
- recognise situations where mathematical reasoning can be applied to solve problems;
- have a spatial awareness;
- have a positive disposition towards investigating, reasoning and problem solving.

Numeracy encompasses the ability to use mathematical understanding and skills to :

- *solve problems;*
- *meet the demands of day-to-day living in complex social settings.*

Adapted from **Literacy and Numeracy for Learning and Life, DES 2011**

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Numeracy in Various Subject Areas

There are ample opportunities to acquire numeracy skills and concepts in your subject area. In addition to this, due cognisance should be paid to appropriate questioning, explanations, justifications and higher order thinking where appropriate. Where numeracy arises in a natural, uncontrived, manner the language, procedure, and concept should be dealt with in a manner that is consistent to that of the mathematics department.

1. In the areas of number, money and measure

➢ Are students encouraged to estimate, calculate, and check their answers?

➢ Are the approaches used in line with and of the same standard as those the students would use in mathematics lessons?

> **Examples**

2. In data handling

➢ Are students encouraged to choose appropriate graphical representations?
➢ Are students encouraged to retrieve, interpret and draw conclusions from the data presented?
➢ Are the uses and misuses of statistics discussed?

> **Examples**

3. In shape and space

➢ Do students express their answers using the correct units?

➢ Are the students encouraged to draw diagrams and other representations (graphs, symbols and words) to develop and explain their ideas?

Examples

4. When using relationships and patterns

➢ Are students encouraged to explore patterns and trends in lessons?

➢ Are students encouraged to explore relationships in lessons?

Examples

Maths Signs

Sign	Meaning	Also known as	Add your own words
➕	**Addition**	• Add • Plus • Sum • Increase	
➖	**Subtraction**	• Subtract • Take away • Minus • Less	
✖	**Multiplication**	• Times • Of	
➗	**Division**	• Share • Divide	
=	**Equals**	• The same as • The same value	
≠	**Not Equals**	• Different • Not the same value	
<	>		

LESS THAN ⟵   GREATER THAN ⟶

```
  ←┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼→
  -5  -4  -3  -2  -1   0   1   2   3   4   5
```

-3 < -2	4 > 3
-4 < 0	5 > -2
-1 < 1	0 > -1
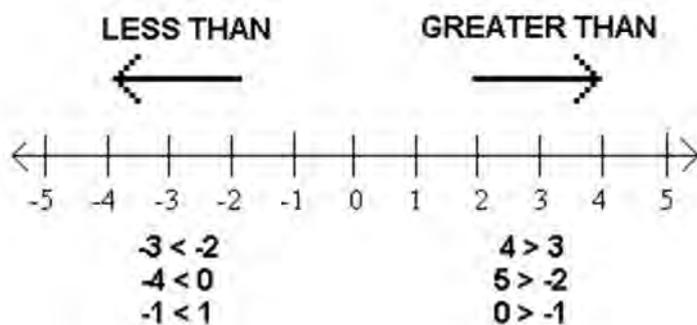
Fractions, Percentages and Decimals

Fraction	Word	Percent	Decimal
1 or 1/1	One Whole	100%	1.00
1/2	Half	50%	0.50
1/3	Third	33.33%	0.3333
1/4	Quarter	25%	0.25
1/5	Fifth	20%	0.20
1/8	Eigth	12.5%	0.125
1/10	Tenth	10%	0.10
1/20	Twentieth	5%	0.05

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Mathematical Language

Word	Everyday English	Mathematical English	Symbol

With thanks to Dr. Máire Ní Ríordáin

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Related Words:

The word/concept looks like this (graph, symbol or picture):

Write a statement in mathematical English including the word/concept:

Definition:

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How did you evaluate your answer?

How did you decide what to do?

Classroom Discussion Approach to Problem Solving

What did you do that helped you understand the problem?

Can something you did here help you solve other problems?

Did you find information that you did not need?

How did you know that the information was not important?

Classroom Discussion Approach to Problem Solving

Did you try something that didn't work? How did you figure out it was not going to work out?

Was there something in this problem that reminded you of another problem that you did before?

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Problem Solving Strategy

THINK - A Whole-School Approach

(Van de Walle et al., 2013, 45)

Talk about the problem

How can it be solved?

Identify a strategy to solve the problem

Notice how your strategy helped you solve the problem

Keep thinking about the problem. Does it make sense?
Is there another way to solve it?

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Things to consider when promoting "Working with Others" in the classroom

Working with Others - Junior Cycle Key Skill

Working with Others - Senior Cycle Key Skill

Basic Elements of Co-operative Learning

Role of the Teacher

Assigning Students to Groups

Sample Ground Rules

Social Skills required for Working with Others

Group Skills

Helpful Phrases for Working with Others

Role of the Student

Role Cards

Working with Others to prevent Behaviour Problems

Sample Strategies

Working with Others Progress Card

See also Chapter 7 of The Nature of Learning: Using Research to Inspire Practice (OECD, 2010)
Co-operative learning: what makes group-work work? Robert E. Slavin

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Key Skills of Junior Cycle, NCCA, 2012

WORKING WITH OTHERS – LINK TO NCCA TOOLKIT

This skill helps learners develop good relationships and to appreciate the value of cooperating to reach both collective and personal goals. Students also learn to value diversity and to engage in collaborative work aimed at making the world a better place.

ELEMENT	LEARNING OUTCOMES – I CAN……………..
Developing good relationships and resolving conflict	• share my ideas honestly and with sensitivity • name, express and manage my emotions appropriately • show respect for different positions and different points of view • prevent and manage conflict situations • give and receive praise and criticism constructively
Cooperating	• take on different roles within groups • agree collective goals and work with others towards achieving shared goals • be flexible and willing to make compromises to achieve a common goal • show appreciation for the contribution of other team members • contribute to decisions as part of a group
Respecting difference	• appreciate others' similarities and differences as a valuable part of life • show respect for people of different cultures, backgrounds, beliefs and sexual orientation • showopeness to learning from different people
Contributing to making the world a better place	• believe in my ability to make a difference • think critically about the world and its problems and propose solutions • get involved in my community—including family, school, local, global, virtual – towards creating a better world • make connections with others who are working to make a positive difference
Learning with others	• work in pairs and larger groups to help each other when we are learning • help other students to understand and solve problems • recognise that many different people can support my learning and know how to get that support
Working with others through digital technology	• demonstrate collaborative learning using digital technology • use digital technology to participate in collaborative learning and communication spaces • respect the rights and feelings of others when using digital media

IDENTIFY THE SPECIFIC ELEMENTS & LEARNING OUTCOMES THAT ARE RELEVANT TO YOUR SUBJECT AREA

WHERE I CAN **EXPLICITY** TEACH THIS THROUGH SUBJECT CONTENT?	
HOW I CAN **EXPLICITY** TEACH THIS THROUGH METHODS I USE?	
WHAT ACTIVITIES CAN I INCLUDE IN MY LESSONS TO DEVELOP & ASSESS THIS KEY SKILL?	
WHAT QUESTIONS CAN I INCLUDE IN MY LESSONS TO DEVELOP & ASSESS THIS KEY SKILL?	

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Key Skills Senior Cycle Framework, NCCA, 2009

WORKING WITH OTHERS – LINK TO NCCA TOOLKIT

This key skill highlights the role that working with others plays in learning and in reaching both collective and personal goals. It helps learners gain some appreciation of the dynamics of groups and the social skills needed to engage in collaborative work. It contributes to an appreciation that working collectively can help.

ELEMENT	LEARNING OUTCOMES – I CAN...............
Working with others in a variety of contexts with different goals and purposes	• recognise that working with others is an intrinsic part of home, school, work and leisure • explore the contexts in which they work in groups (e.g., learning groups, sports groups, family groups) and examine the differences between them • recognise the need to respond flexibly in different contexts
Identifying, evaluating and achieving collective goals	• work in pairs and larger groups to plan the work of the group • co-operate with other members of the group to identify collective goals • co-operate with group members to identify how different roles can contribute to the overall goals • communicate ideas and needs within the group • agree action plans for achieving the goals • agree methods for keep each other informed of progress
Identifying responsibilities in a group and establishing practices associated with different roles in a group	• help to break tasks down into parts as a way of sharing the work of the group • take on the responsibilities of the role whether as a team member or a team leader • recognise how his/her role blends with the responsibilities of others in the group • express views about how the work of the group is progressing
Developing good relationships with others and a sense of well-being in the group	• listen carefully to other points of view • develop empathy and see alternative perspectives • express emotion in appropriate ways • help others to feel included in the group • help motivate the group to persist in the face of difficulties • celebrate the achievements of the group
Acknowledging individual differences, negotiating and resolving conflicts	• respect the rights and views of others in the group • recognise that different positions and viewpoints are likely to be adopted and expressed • identify areas of agreement and disagreements among the different positions • make suggestions about possible compromises and alternative ways forward • agree ways to resolve conflict
Checking progress, reviewing the work of the group, and personally reflecting on one's own contribution	• keep to deadlines and agreed plans • monitor progress in the group against agreed plans • negotiate individual responsibilities • critically evaluate and change the approach of the group if necessary • participate in evaluating the outcomes against the collective goals • reflect on their own contribution to the group and identify strengths and weaknesses • identify ways of further improving their skills in working with others

Basic Elements of Co-operative Learning

Co-operative learning can be defined as a **structured form of group work** where students pursue common goals while being assessed individually. The most common model of co-operative learning is that of Johnson, Johnson and Smith. This model incorporates five specific tenets, which are individual accountability, mutual interdependence, face-to-face promotive interaction, appropriate practice of interpersonal skills, and regular self-assessment of team functioning. While different co-operative learning methods exist, the core element held in common is a focus on co-operative incentives rather than competition to promote learning.

Basic Elements of Co-operative Teams

Positive Interdependence
Team members perceive that they need each other in order to complete the group's task ("sink or swim together"). Instructors may structure positive interdependence by establishing **mutual goals** (maximize own and each other's productivity), **joint rewards** (if all group members achieve above the criteria, each will receive bonus points), **shared resources** (members have different expertise), and **assigned roles** (summarizer, encourager of participation, elaborator).

Individual Accountability
Assessing the quality and quantity of each member's contributions and giving the results to the group and the individual.

Face-to-Face Promotive Interaction
Team members promote each other's productivity by helping, sharing, and encouraging efforts to produce. Members explain, discuss, and teach what they know to teammates. Instructors structure teams so that members sit knee-to-knee and talk through each aspect of the tasks they are working to complete.

Interpersonal And Small Group Skills
Groups cannot function effectively if members do not have and use the needed social skills. Instructors emphasize these skills as purposefully and precisely as jobperformance skills. Collaborative skills include instructorship, decision-making, trustbuilding, communication, and conflict-management skills.

Group Processing
Groups need specific time to discuss how well they are achieving their goals and maintaining effective working relationships among members. Instructors structure group processing by assigning such tasks as (a) list at least three member actions that helped the group be successful and (b) list one action that could be added to make the group even more successful tomorrow. Instructors also monitor the groups and give feedback on how well the groups are working together.

Source: Cooperation in the Classroom, Johnson, Johnson and Holobec, 5:7, revised 1991

Role of the Teacher in Co-operative Learning Groups

Role	Description
Make Pre-Instructional Decisions	In every lesson, the teacher formulates objectives, decides on the size of the groups, chooses a method for assigning students to groups, decides which roles to assign to group members, arranges the room and arranges the materials students need to complete the assignment.
Explain the Task and Co-operative Structure	In every lesson, the teacher explains the academic assignment to students, explains the criteria for success, structures positive interdependence, explains the individual accountability and explains the behaviours that they expect to see during the team-work session.
Monitor and Intervene	While the teacher conducts the lesson, he/she monitors the learning groups and intervenes when needed to improve task work and teamwork. He/she also brings closure to the lesson by consolidating the material learned throughout the lesson.
Evaluate and Process	Teachers assess and evaluate the quality and quantity of student achievement and ensure students carefully process the effectiveness of their learning groups. Teachers also ensure that students create plans for improvement and praise the hard work of team members.

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Assigning Students to Groups

- The teacher assigns the group.
- Each group should have a mix of abilities, gender, motivation levels, etc.
- Do not necessarily put students with their friends unless you have a good reason to do so. If students protest, explain that the groups will be changing later on so they will have opportunities to work with other groups.
- Start out with small groups (2 or 3) until students become skilful in group work. The shorter the time available, the smaller the learning group should be.
- Assign each student a job or role but rotate them frequently.
- Graduate the tasks so that there are some tasks that everyone can do with ease and some more challenging tasks or questions. That way, everyone can contribute something to the group. Make your expectations clear so that students know what you want them to do and how to behave.
- Observe and monitor students working.
- Agree ground rules.

Sample Ground Rules for Working with Others

(It is best if the students agree on their own)
- every group member is responsible for completing the task.
- every group member is responsible for making sure all the group members know and understand the answers.
- be open to others ideas
- take turns
- look at the speaker
- help each other
- no put downs
- criticize ideas, not people
- use quiet voices / inside voices / team voices
- sit knee to knee and eye to eye
- always make eye contact with others when you are speaking
- always look at the person speaking and listen
- include everyone and encourage everyone's participation in the work
- individual responsibility - make sure you learn something interesting and useful today
- team responsibility - make sure your team learn's something interesting and useful today

NCCA toolkit

Social Skills needed for Group Work

Effective small-group work requires preparation, and a number of preconditions have to be met for it to be effective. Firstly, students must be able to cooperate with one another and provide each other with feedback in a constructive way. A number of studies have found that while small-group work is positively related to achievement when group interaction is respectful and inclusive, use of group work is actually negatively related to achievement if group interaction is disrespectful or unequal. This can happen when students don't have the necessary social skills to interact positively with peers. Skills of sharing, turn-taking, communication, and listening cannot be taken for granted.

One simple strategy which can help develop listening skills is to ask students to paraphrase what another student has said before allowing them to contribute a new idea. Use paraphrasing to: avoid confusion (Let me see if I heard you right…), confirm understanding (Are you saying that…?), try to understand something from another's perspective (In other words, what you mean is…).

Other ways of teaching the social skills needed for successful group work include building a T Chart and keeping it on view in the classroom. To do this you write the name of the skill to be practiced at the top of a chart. Label the left side 'Looks like' and the right side 'Sounds like'. Then under each column ask the students to brainstorm examples for each side and write them down. This might look something like this:

Working Together

Looks like:	*Sounds like:*
everyone has a job	*different voices talking*
people look involved	*"inside voices"*
might be movement	*listening attentively*
looking at whoever is talking	
knee to knee and eye to eye	
having fun while learning	

NCCA toolkit

Group Skills

Listening

Looks like:	Sounds like:

Encouraging

Looks like:	Sounds like:

Summarising

Looks like:	Sounds like:

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Respecting Each Other

Looks like:	*Sounds like:*

Contributing Ideas

Looks like:	*Sounds like:*
Leaning forward	In my opinion...
Open gestures and postures	I have a suggestion...
Taking turns	We could...
	What if we....?

Checking for Understanding

Looks like:	*Sounds like:*
Eye contact	Explain that to me please
Leaning forward	Can you show me?
Interested expression	Tell us how to do it
Open gestures and postures	How did you get that conclusion?
	Can you give us some examples please

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Helpful Phrases for Working with Others

I think…. because (i.e. whenever someone makes a statement they must justify it.)

I agree/disagree because…

How can we back-up this idea with evidence?

I'm not sure what you mean. Would you like me to go over that again?

Do I understand you correctly, are you saying….?

Here's a way to remember this…

I think that's an interesting point but we'd better stick with the question we're working on right now.

Let's look at the other side of the argument for a minute.

Let's summarise our main ideas so far.

Let's check to see if everyone agrees with what we've written down so far

Let's take turns to make sure that everyone has a chance to speak.

Why don't we try it this way as we don't have much time left?

Come on, let's keep moving! Let's hear from someone who hasn't had a chance to speak yet?

NCCA toolkit

Role of the Student in Co-operative Learning Groups

Role	Description
Reader	The reader's task to is to read the material to the group slowly, carefully and with expression so that group members will be engaged and interested in the piece and will remember it for a long time
Recorder	The role of the recorder is to make a note of any ideas/suggestions/answers coming from the group. The recorder will also work with the team in reaching consensus on the answers that the group like best which in turn will be reported back to the full group
Checker	The checker's role is to ensure that everyone in the group is contributing and sharing ideas. The checker will ask probing questions to members of the group to determine if each member of the group can explain their answers clearly. When decisions on best answers are made, the checker will strive to ensure that everyone in the group can explain the answer clearly and give reasons for that particular answer
Summariser	At various stages in the group discussion the summariser will give a quick run through of ideas shared to date and ensures that everyone in the group agrees which what was been discussed/decided
Supporter/ Encourager/ Praiser/Energiser	This person has many tasks including encouraging silent members of the group to participate, praising any good ideas/suggestions and effort and keeping the group energised at all times
Task Master/ Director	The Task Master/Director will define the task for the team, help the group decide how to do the task and decide with the group who will do what
Scout	The scout is the person who is allowed to move between groups to seek ideas/opinions and/or swap ideas/suggestions
Dictionary Manager/ Textbook Checker/Calculator Checker	This person will have the role of using a dictionary/textbook/calculator to check for the accuracy of the work and/or to gleam more ideas which will assist the group in completing the task
Turn Taker	The turn taker will ensure that each member of the group has an opportunity to contribute to the group discussion. They ensure a healthy balance between the dominant and silent contributors in the group
Timekeeper	The role of the 'Timekeeper' is to ensure that the group is abiding by the time set for the particular task. The time taker will also work in conjunction with the turn taker to ensure that all members of the group have an opportunity to contribute within the allocated time frame
Group Observer	The group observer is responsible for moving between the groups, observing co-operative learning roles in each group and allocating bonus points to members of the group
Other	

Role Cards

FACILITATOR

ROLE:
The **Facilitator** establishes a collaborative relationship within the group, focuses the work around the learning task, and ensures that every group member feels included and has an opportunity to participate.

PROMPTS:
- Let's hear from _____ next....
- That's interesting, but let's go back to our task...
- Let's look again at this area....
- What strategies will we use to do this?

CHECKER

Look carefully at details

ROLE:
The **Checker** ensures that everyone on the team is sharing ideas and asks probing questions to ensure that the material is understood by all.

PROMPTS:
- What do you mean by that?
- Could you clarify that statement?
- Could you please repeat what you have just said?
- Could I interrupt you at this point to ask.....?

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Role Cards

RECORDER

ROLE:
The **Recorder** makes notes of ideas, conclusions and decisions made by the group. S/he may use a graphic organiser or flipchart to illustrate same.

PROMPTS:
- How would you like me to write that down?
- I think you said… Is that right?
- Should we put this idea here?
- How about I circle the ideas that the team likes best?
- Let's link this idea here…with this one, here….

TIMEKEEPER

ROLE:
The **Timekeeper** ensures that each member of the group contributes equally and receives equal time. S/he encourages the group to stay on task and times the proceedings.

PROMPTS:
- We are just at the halfway point
- We have five minutes left to discuss this
- Could we wrap this up in the next three minutes?
- It's _____ time to make his/ her point now
- Could I ask _____ for his/ her opinion at this point?

Using Co-operative Learning to Prevent Behaviour Problems

If you're currently struggling to get students motivated in classes and face continuous behaviour problems, cooperative learning can help. Properly managed group-work sessions can reduce behaviour problems in five ways:

- **There is less incentive for students to disrupt the lesson** to get the teachers attention because they are already receiving attention – from the other members of the group

- **Positive peer relations are developed.** As a result of students helping each other to reach a common goal, they build strong bonds. As the sense of community grows in the class through regular group work sessions, there are fewer arguments between students

- **Lower achieving students gain confidence and motivation.** By working collaboratively with higher achieving students, low achieving students are able to take part in activities without feeling they lack the necessary skills and understanding. By being actively involved in the class activities instead of being bored or frustrated, they are less prone to disrupt. The high ability students also benefit from the process of guiding and supporting their fellow group members, as their understanding of the material is reinforced through teaching others.

- **Social skills are naturally developed**, skills like self-expression, decision-making, responsibility and accountability, sharing, listening and conflict management are naturally practiced and developed during co-operative learning sessions. This has the knock-on effect of reducing the occurrence of behaviour problems brought about due to a lack of these skills.

- **It saves the teacher time.** Once students get used to the co-operative learning framework, the students begin to teach themselves. The teacher becomes free from constant requests for attention and can give quality support when it is required rather than when it is demanded

© Behaviour Needs

Think - Pair - Share - Square

This strategy allows you to quickly engage the whole class without losing any time moving furniture or formulating groups. Think-Pair-Share-Square is a series of steps that enables the students move through the stages of individual work, paired work and group work before feeding back to the whole class very simply.

Think: The students spend time in silence writing or thinking about their own ideas.

Pair: Students turn to the person next to them to discuss their ideas with a partner.

Share: Students share their answers with another group

Square: Two pairs work together as a new group to complete the task of agreeing on a response from the first two answers that the pairs have come up with. They also elect who will be speaking. This stage is crucial for extracting the high level explanation behind why an answer was chosen. This reduces the amount of answers that a teacher has to elicit from a class. It helps promote student learning as students discuss and teach each other.

Think-Pair-Share

Think or write about the question. Share or listen. Then switch roles. One person talks, the other listens. Be ready to share both of your ideas.

Tell what you think.	Listen and respond to your partner.	Share with the group.
I think that _____ because One reason why I feel this way is	My idea is similar to yours. I also think that My idea is different from yours. I think Will you explain that again?	_____ raised a good point. He/she said that _____ pointed out that We agreed that _____, because One important idea we discussed is

Questions or Prompts	What I thought	What my partner thought	What we will share

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Read and Explain Pairs

Whenever you give material to students to read, students may read it more effectively in co-operative pairs than individually.

1. Assign students to pairs (one high reader and one low reader in each pair). Tell students what specific pages you wish them to read. The **expected criterion for success** is that both members are able to explain the meaning of the assigned material correctly.

2. The **task** is to learn the material being read by establishing the meaning of each paragraph and integrating the meaning of the paragraphs. The co-operative goal is for both members to agree on the meaning of each paragraph, formulate a joint summary, and be able to explain its meaning to the teacher.

3. The procedure the student pairs follow is:
   a. Read all the headings to get an overview.

   b. Both students silently read the first paragraph. Student A is initially the **summarizer** and Student Be is the **accuracy checker.** Students rotate the roles after each paragraph.

   c. The **summarizer** summarizes in his or her own words the content of the paragraph to his or her partner.

   d. The **accuracy checker** listens carefully, corrects any misstatements, and adds anything left out. Then he or she tells how the material relates to something they already know.

   e. The students move on to the next paragraph, switch roles, and repeat the procedure. They continue until they have read all the assignment. They summarize and agree on the overall meaning of the assigned material.

4. During the lesson you (the teacher) systematically (a) monitor each reading pair and assist students in following the procedure, (b) ensure **individual accountability** by randomly asking students to summarise what they have read so far, and (c) remind students that there is **intergroup co-operation** (whenever it is helpful they may check procedures, answers, and strategies with another group or compare answers with those of another group if they finish early).

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Placemat Activity

The **Placemat Activity** can be used with a wide variety of questions and prompts or for a wide range of learning goals, e.g.
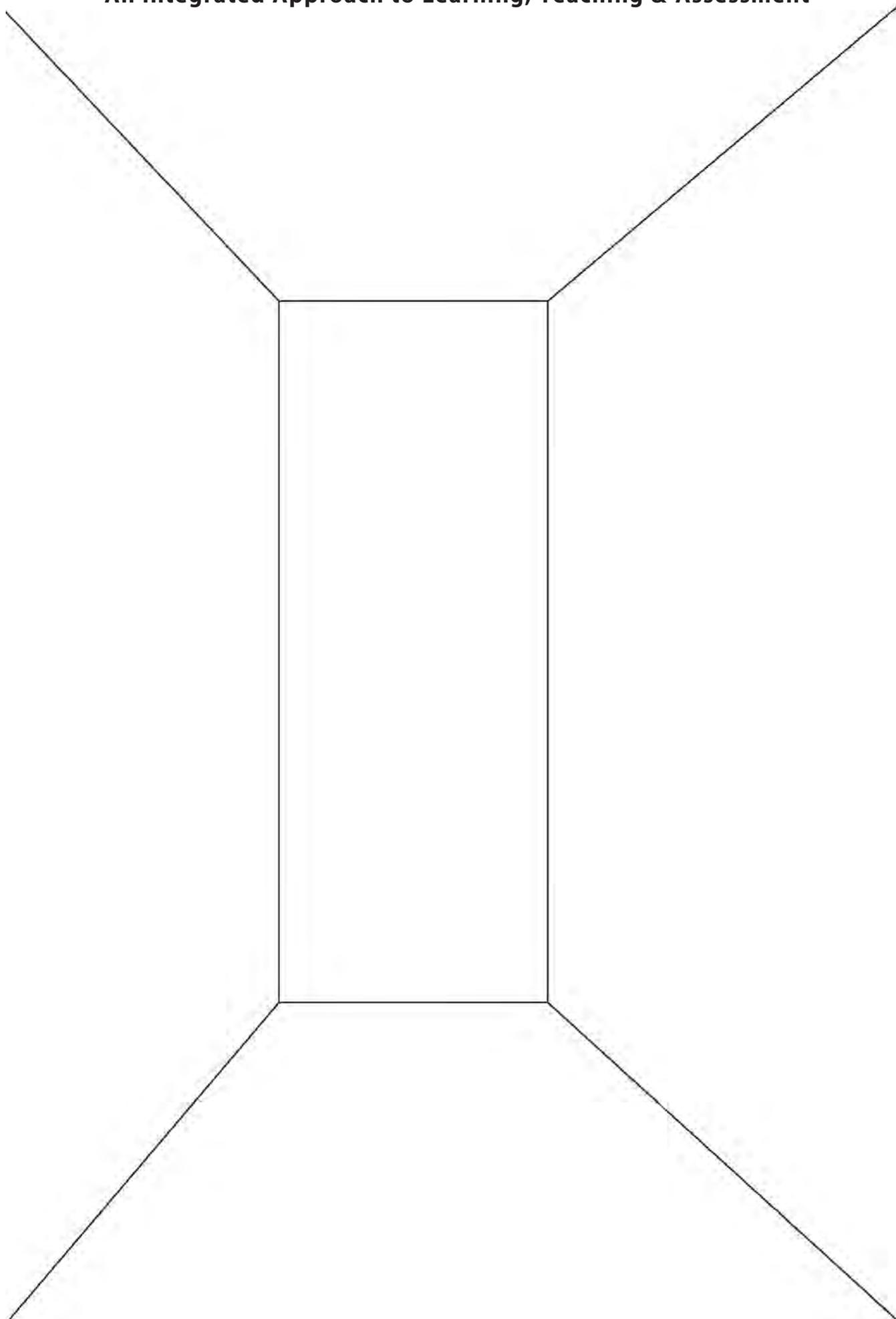
- To encourage students to share ideas and reach a consensus about a topic/idea
- To activate the prior knowledge of a topic among students
- To help students share problem-solving techniques
- To take group notes during a video or oral presentation
- To summarise learning after the class and/or to be used as an opening review for the subsequent lesson

Groups of four students are ideal for the placemat technique but it can also work with 3 – 6 students by amending the template.
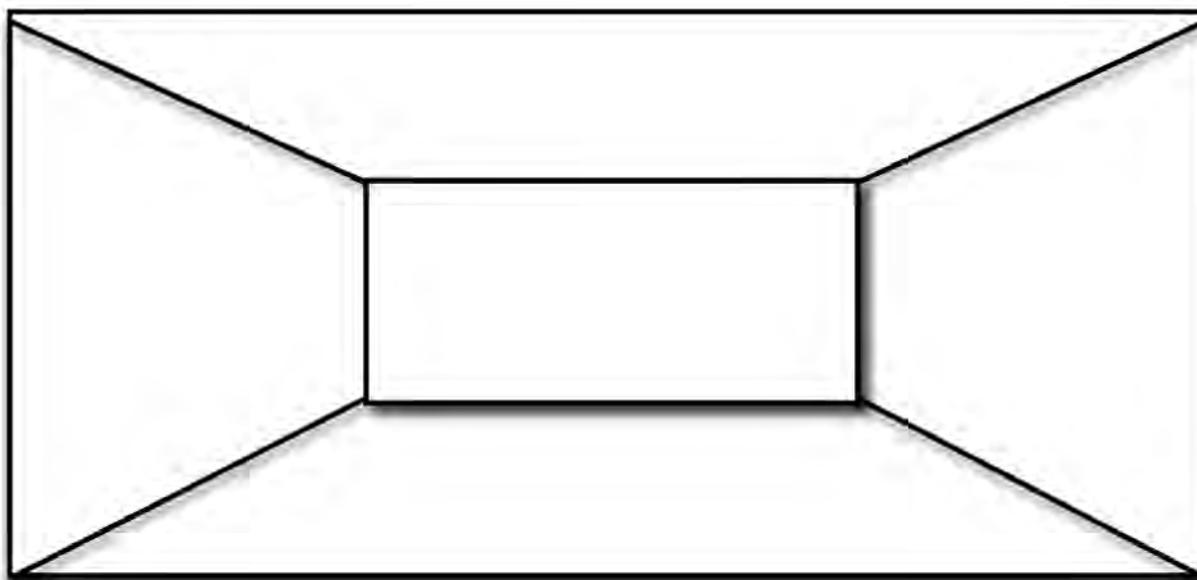
Tips

1. Discuss, record and post a labelled diagram of the Placemat on the board so that students always have a visual reference of the organisation and required actions.
2. Consider the composition of the small groups and vary the membership according to the students' learning styles and interaction, subject-matter expertise, etc. Some groups will require more teacher support in carrying out the task in other groups.
3. Use the placemats as a record of collective student thinking and post the ideas for other groups to see.

Placemat Activity: Step-by-Step Instructions

	What teachers do...	What students do...
Before	• Divide students into groups (ideally of 4). • Decide on a question/concept/problem for the centre of the placemat. • Distribute the placemat template to each group. • If using more or less than 4 students per group, ask the students to divide a blank sheet of paper into sections equal to the number of students in the group, leaving a rectangle in the centre of the sheet for the recording of the group consensus.	• Organise the placemat according to the number of students in their group so that there are sufficient sections for the students and a centre rectangle for recording their group consensus ideas.
During	• Direct each group member to think about, then silently write ideas/information that relate to the question in their personal area of the chart paper. • Give students a pre-determined amount of time.	• Gather their thoughts about the chosen question. • Write silently in their own area of the paper, respecting the space and silence of all members of the group.
After	• Give a signal for students in each group to discuss their idea and information and to agree on a response to be shared with the entire class. • Call on one member from each group to share their group's response with the whole class. • Assess for understanding by listening to student responses. • Use information gained throughout the activity to inform further teaching decisions and strategies. • Have students post the charts on notice boards/class wall to further share their group's thinking with the class.	• Take turns sharing their ideas with the group. • Engage in discussion with all group members to reach consensus on a group response. • Use communication skills such as active listening and requesting clarification. • Record the group response in the centre of the placemat. • Actively listen as each group's placemat is presented. • Post the chart for further sharing with the class and as a record of the topic learned so that the students and teacher can make reference to it in future lessons.

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Anticipation Exercise

Topic:				
Name:	Date:	Score:	Before:	After:

BEFORE / **AFTER**

Agree	Disagree		Statement	Agree	Disagree	Evidence
		1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				

Instructions: Guess answers, read passage/watch video, answer again, compare results before and after.

NOTE: Students can justify to each other why they agree or disagree with each statement and reach a consensus employing many of the skills of working with others.

New Word	Meaning

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Jigsaw Method

Rationale

Using the jigsaw teaching strategy is one way to help students understand and retain information, while they develop their collaboration skills. This strategy asks a group of students to become "experts" on a specific task or body of knowledge and then share that material with another group of students. These "teaching" groups contain one student from each of the "expert" groups. Students often feel more accountable for learning material when they know they are responsible for teaching the content to their peers. The jigsaw strategy is most effective when students know that they will be using the information they have learned from each other to create a final product, participate in a class discussion, or acquire material that will be on a test.

Procedure

Step One: Preparation

Select the material you want students to explore. It might be a collection of documents (e.g. readings, images, charts) or it could be a series of questions. Also, decide how many students you would like to work together in an "expert" group, Teachers often find that groups of 3 - 5 students work best. Sometimes it makes sense to make groups randomly (e.g. by counting off) while other times you might want to divide students in advance to balance strengths, needs and interests. You can assign the same material to more then one group.

Step Two: Students Work in Expert Groups

In this step, small groups of students ("experts") are responsible for reviewing specific material so that they can share this information with their peers. "Expert" groups work best when students have clear expectations about the type of information they are supposed to present to their peers. Therefore, it is often helpful to provide a chart or a series of questions that students answer together in their expert groups. It is important that all group members understand the material they are responsible for presenting. To avoid having students present inaccurate or misleading information, teachers can review and approve of content before this information is shared with students in the other groups.

Step Three: Students Meet in Teaching Groups

After "expert" groups have a solid understanding of the material they will be presenting, assign students to "teaching" groups. "Teaching" groups are typically composed of one or two members from each expert group. Experts take turns presenting information. Often teachers ask students to take notes while the experts present. For greater accountability it is best if students are required to synthesize the material presented as part of an assignment, presentation or discussion.

Step Four: Synthesis and Reflection

"Teaching" groups can be assigned a task that requires them to synthesize the information that has been shared, such as answering a larger question, comparing texts, or generating a plan of action. Or, students can synthesize information individually or in pairs. It is appropriate to structure a class discussion that asks students to draw from the material they just learned to answer a question about history and apply this information to society today.

Using the Little Book

- This is a way of getting students to learn small pieces of information (e.g. definitions) by teaching one another.
- Divide the material to be learned into a number of small parts.
- Teach the students to make The Little Book (see previous page of this pack)

Preparing the little book for use

Instruct students to:

1. Write the title of the book on the front cover
2. Write their name on the front cover
3. Number each page
4. Place a title (e.g. definition term) on each page

Using the Little Book

- Each student is given a slip of paper with a small amount of information.
- They learn their piece of information and write it in their own words on the appropriate page in their book. The teacher takes back the slips of paper (to ensure that they explain the information to each other and do not simply copy it)
- The students' task is to fill their book.
- Student A teaches student B the piece of information he/she has learned. When student A is satisfied that student B knows it, student B writes it onto the appropriate page in his/her book and student A checks that B knows the information and then initials the page to confirm this.
- Student B then does the same.
- The students circulate around the class until they have all completed their little book

Notes

It is recommended that students teach their piece of information at least three times before being given permission to teach something they have been taught by a class mate.

Making the Little Book
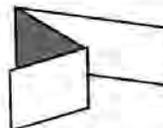
Take an A4 or A3 piece of paper
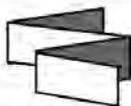
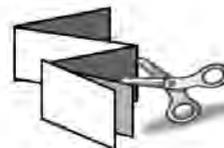1. Fold it in two on the long side

2. Fold in two along the short side

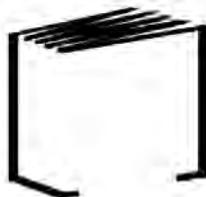3. Fold the front part in two back on itself

4. Fold the back part back on itself – there should now be an accordion type of movement possible

5. Split the top of the front and the back of the accordion

6. You now have a book with five leaves (one very thick leaf in the middle)

Working with Others Progress Card

Student: _____

Week Beginning: _____

1	Needs improvement
2	More work required
3	Satisfactory
4	Good
5	Very good

	Monday	Tuesday	Wednesday	Thursday	Friday
Student					
Teacher					

Teacher Comment

You did well on: _____

You also did well on: _____

And now you might consider: _____

_____

_____

Student Comment

What I need to do to improve when I work with others:

_____

_____

How will I know that I am making progress when I work with others?

(1) _____

(2) _____

(3) _____

An Integrated Approach to Learning, Teaching & Assessment

KEY SKILLS

BEING LITERATE

COMMUNICATING

MANAGING MYSELF

WORKING WITH OTHERS

STAYING WELL

BEING CREATIVE

MANAGING INFORMATION & THINKING

BEING NUMERATE

Junior Cycle Key Skills

INFORMATION PROCESSING

COMMUNICATING

CRITICAL AND CREATIVE THINKING

THE LEARNER

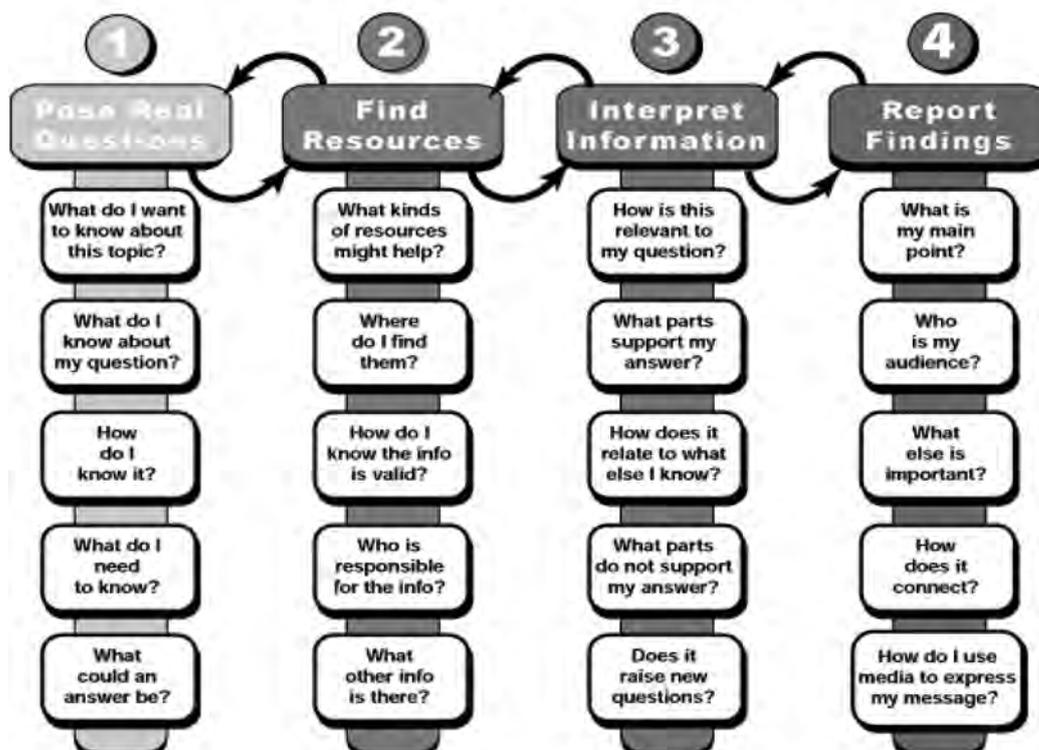BEING PERSONALLY EFFECTIVE

WORKING WITH OTHERS

Senior Cycle Key Skills

Inquiry-based Learning

The essence of inquiry-based learning is that students participate in the planning, development and evaluation of projects and activities. Teachers can take many approaches to crafting an inquiry-based project, but Dr. Cornelia Brunner of the Center for Children and Technology breaks it into four main parts: Posing Real Questions, Finding Relevant Resources, Interpreting Information and Reporting Findings.

The Inquiry Process

1 Pose Real Questions	2 Find Resources	3 Interpret Information	4 Report Findings
What do I want to know about this topic?	What kinds of resources might help?	How is this relevant to my question?	What is my main point?
What do I know about my question?	Where do I find them?	What parts support my answer?	Who is my audience?
How do I know it?	How do I know the info is valid?	How does it relate to what else I know?	What else is important?
What do I need to know?	Who is responsible for the info?	What parts do not support my answer?	How does it connect?
What could an answer be?	What other info is there?	Does it raise new questions?	How do I use media to express my message?

Many useful templates for planning and evaluating your project can be found here: **http://bit.do/inquiryprocess**

See next page for examples

QR Code

http://bit.do/inquiryprocess

Example 1

I think maybe:

I don't know:

I want to know:

I already know:

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Example 2

Another question:

Another question:

Another question:

My main question:

2:

Another question:

Another question:

PDST

Example 3

? New questions:

How good the info is:

What I learned:

Where I learned it:

The Nature of Learning: Using Research to Inspire Practice (OECD, 2010)

	Summary of the main chapters:
The Nature of Learning USING RESEARCH TO INSPIRE PRACTICE Edited by Hanna Dumont, David Istance and Francisco Benavides OECD	1. Analysing and designing learning environments for the 21st century 2. Historical developments in the understanding of learning 3. The cognative perspective on learning: 10 cornerstone findings 4. The crucial role of motivation and emotions in classroom learning 5. Learning from the developmental and biological perspective 6. The role of formative assessment in effective learning environments 7. Co-operative learning: what makes group work work? 8. Learning with technology **9. Prospects and challenges to inquiry-based approaches to learning**

Chapter 9: Prospects and challenges for inquiry-based approaches to learning *(Brigid Barron and Linda Darling-Hammond, Stanford University School of Education)*

Need for Inquiry-based Approaches to Support 21st Century Skills

Students need to:

- Develop **interpersonal** and **self-directional** skills

- Manage **projects**

- Competently **find** resources and **use** tools

- Think **critically**

- Solve **complex problems**

- Demonstrate **application** of learning

- Engage in more **'authentic'** learning (real life)

Three Approaches

- Project-based

- Problem-based

- Learning by Design

Project-based Learning

Involves the completion of complex tasks that typically result in a realistic product, event or presentation to an audience. The task must be:

1. Authentic, by posing problems that occur in the real world and that people care about.

2. Driving questions that lead students to encounters central concepts or principles of a discipline.

3. Focused on a constructive investigation that involves inquiry and knowledge building.

4. Student-driven, in that students are responsible for making choices and for designing and managing their work.

Problem-based Learning

Is a specific type of project that aims to teach problem definition and solution strategies. Students work in small groups to investigate meaningful problems, identify what they need to learn in order to solve a problem, and generate strategies for solution.
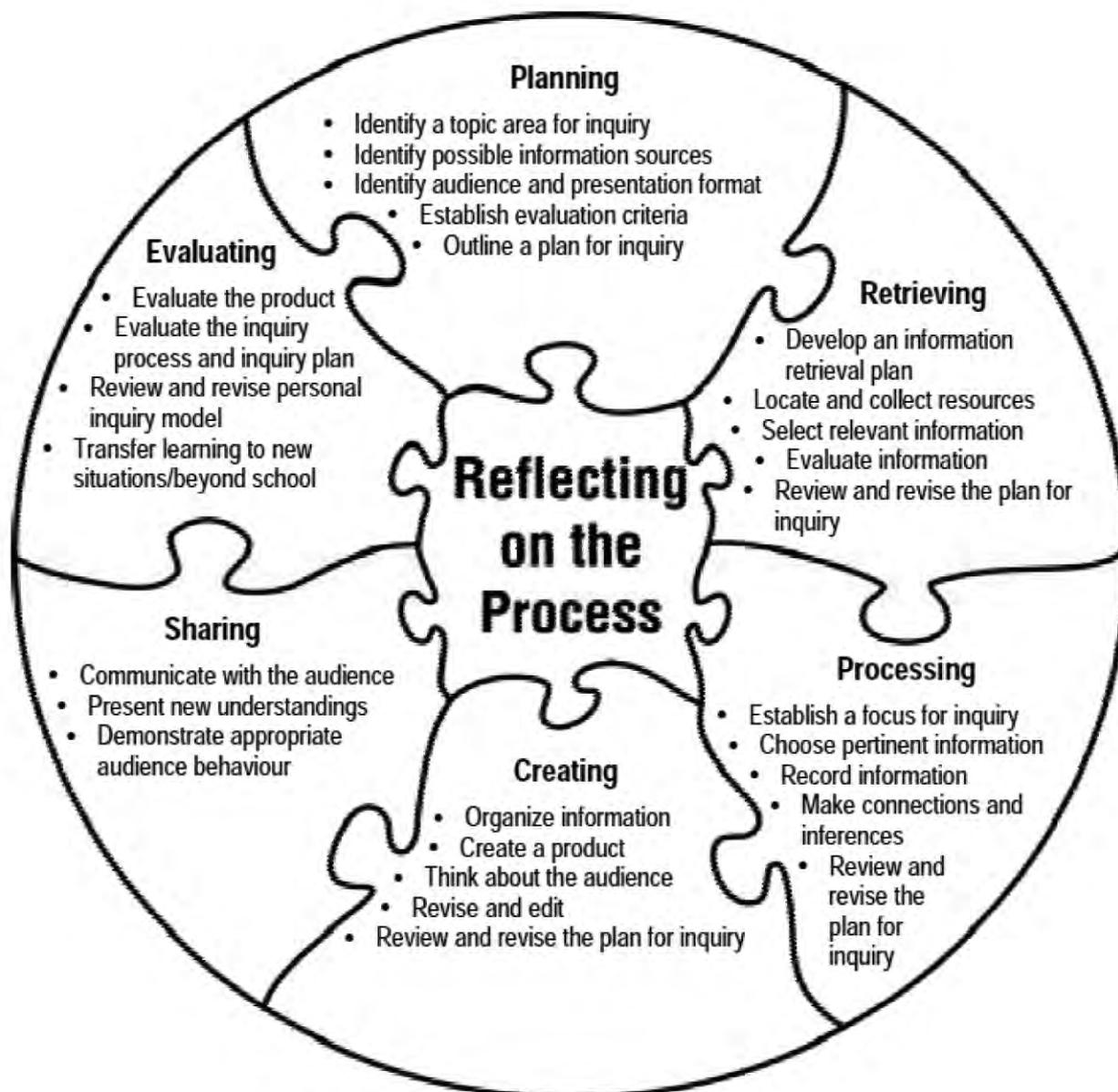
Problems are:

- realistic and ill-structured *(not textbook but real word problems with multiple solutions and methods for reaching them);*

- resonate with students' experiences;

- promote argumentation;

- provide opportunities for feedback;

- and allow repeated exposure to concepts.

Learning by design

A third genre of instructional approaches has grown out of the idea that children learn deeply when they are asked to design and create an artefact that requires the understanding and application of knowledge.

- The complexity of the work often dictates the need for collaboration and distributed expertise.

- A variety of valued cognitive tasks are employed such as setting constraints, generating ideas, prototyping, and planning through "storyboarding" or other representational practices.

- Design-based approaches can be found in subjects such as science, technology, art, engineering and architecture.

Inquiry-based Model

Planning
- Identify a topic area for inquiry
- Identify possible information sources
- Identify audience and presentation format
  - Establish evaluation criteria
  - Outline a plan for inquiry

Evaluating
- Evaluate the product
- Evaluate the inquiry process and inquiry plan
- Review and revise personal inquiry model
- Transfer learning to new situations/beyond school

Retrieving
- Develop an information retrieval plan
- Locate and collect resources
- Select relevant information
- Evaluate information
- Review and revise the plan for inquiry

Reflecting on the Process

Sharing
- Communicate with the audience
- Present new understandings
- Demonstrate appropriate audience behaviour

Creating
- Organize information
- Create a product
- Think about the audience
- Revise and edit
- Review and revise the plan for inquiry

Processing
- Establish a focus for inquiry
- Choose pertinent information
- Record information
- Make connections and inferences
- Review and revise the plan for inquiry

Source: Focus on Inquiry

A Teacher's Guide to Implementing Inquiry-based Learning

(Tips for Teachers in an Inquiry-Based Classroom)

Inquiry Based Learning: Tips for Teachers

Adapted from Focus on Inquiry - A Teacher's Guide to Implementing Inquiry Based Learning (2004)

Tips for Teachers: Building a Culture of Inquiry

- Approach inquiry with enthusiasm and excitement.
- Admit that inquiry involves the unexpected for you and for students.
- Model the inquiry process in your instruction (show as well as tell).
- Use the language of inquiry.
- Post the Inquiry Model (see p. 10) in your classroom and the school library.
- Facilitate the process—discuss, clarify, support and monitor.
- Evaluate the process (and make it really count).
- Use technology to do what would be impossible otherwise.
- Set a specific time for inquiry-based learning.

Tips for Teachers: Building for Student Success

- For those students with little or no background knowledge of a topic, teachers must provide information and background that motivate students. Students need past experience and knowledge of a topic in order to do productive inquiry (Jonassen, 2000).
- Teachers often need to help inquirers understand that people with particular beliefs and purposes created the information they find, whether in a library book, in a newspaper or on an Internet site, and that information is not just objective facts.
- Teaching students how to compare, contrast, and synthesize data helps them through the disorder that can occur in this phase.
- Teaching students audience appreciation skills and strategies and focusing on the positive helps to support students through this phase.
- Many schools develop a school-wide plan for teaching inquiry based learning skills and strategies so that all students build on past learnings and experience inquiry-based learning projects.
- Using a classroom library to offer resources on a topic is one way of introducing a variety of resources to support the inquiry.

Tips for Teachers: Reflecting on the Process at any Phase

- Teach students that inquiry involves the unexpected for teachers and students.
- Teach students to self-check: "Is this information even remotely connected to my question?"
- Share the "high point of the day" and the "frustration of the day."

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- Teach students to self-check: "What did I learn? How well did I achieve my goal? What changes did I have to make to meet my goal? What changes will I make the next time I do this? Where else can I use these strategies?"

Tips for Teachers: Retrieving

- Teach the difference between relevant (generally related) and pertinent (directly related) information.
- Beware of hyper-leaping—teach searching skills for databases and for the Internet.
- Teach students to self-check—"Is this information even remotely connected to my question?"
- Expand resource horizons—use databases.
- Teach critical reading skills—skimming and scanning skills.
- Teach critical thinking skills—comparing and contrasting.
- Teach interviewing skills and protocols.
- Use the Internet to delve into topics—preview and bookmark appropriate sites.
- Help students to evaluate websites—currency, coverage, objectivity, accuracy, authority.
- Teach students what to do when they come across inappropriate materials (variation on "stop, drop and roll").
- See Appendix K, p. 101.

Tips for Teachers: Processing

- Teach critical reading skills—skimming and scanning skills.
- Teach critical thinking skills—comparing and contrasting.
- See Appendices L and M, pp. 102–103.

Tips for Teachers: Creating

- Limit the use of time and technology for "glitz."
- Use technology to do what would be impossible otherwise.
- See Appendix N, p. 104.

Tips for Teachers: Sharing

- For oral presentations, provide tips on effective public speaking.
- For presentations using technology, book equipment well in advance and allow sufficient time to address glitches.
- Teach audience appreciation to your class.
- Be supportive of student products.
- Allow sufficient time for sharing.
- Review *Researching and Making Presentations: Grades 5 to 12* for ideas.
- See Appendices O and P, pp. 105–106.

Tips for Teachers: Evaluating

- Stick to predetermined evaluation criteria and processes.
- Evaluate the final product as part of the whole process.
- Use a separate rubric as an assessment instrument.
- Involve students in assessment.
- Consider assessment tools such as the *Classroom Assessment Tool Kit for the Information and Communication Technology (ICT) Program of Studies*.
- See Appendices Q and R, pp. 107–108.

Tips for Teachers: Metacognition

Teachers work with students to assist them in understanding their thoughts during the inquiry process. Students' personal growth and motivation to learn are enhanced when teachers:

- pose questions about thinking and feeling, and allow students to reflect upon their learning progress
- honour diverse learning styles and perspectives
- model the inquiry process out loud on a consistent basis
- explicitly call the students' attention to the Inquiry Model and to the particular phase at which they are working
- set timelines
- review the inquiry process through class discussions, journal writing and ongoing and retrospective analyses of the data generated throughout the inquiry process.

Roles of the Teacher in an Inquiry-based Classroom

- Motivator
- Diagnostician
- Guide
- Innovator
- Experimenter
- Researcher
- Modeller
- Mentor
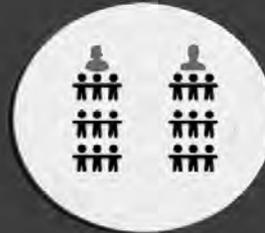- Collaborator
- Learner (Crawford, 2000)

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PDST.ie/teamteaching

Team Teaching - 5 Approaches

Station Teaching:

Parallel Teaching:

Alternative Teaching:

Teaming:

One Teaching, One Assisting:

THE SIX-STEP SCHOOL SELF-EVALUATION PROCESS FOR POST-PRIMARY SCHOOLS 2016 - 2020

INVESTIGATIVE PHASE

Step 1 – Identify Focus
Chapter 3 of the SSE Guidelines 2016-2020

In the next cycle of school self-evaluation, teaching and learning continues to be the focus. Schools should continue to use the process to implement national initiatives and to identify and work on aspects of their own teaching and learning practices which require development and improvement. These aspects of teaching and learning will vary according to the needs of schools. Typically, most schools will use the process to assist them in introducing and embedding relevant aspects of the *Framework for Junior Cycle*. It is expected that schools will also use the process to maintain a meaningful focus on literacy and numeracy.

* Schools should select a minimum of two and a maximum of four aspects of teaching and learning as the focus for their self-evaluation process from 2016 to 2020. e.g. assessment practices, teaching and learning the key skills, engagement in learning. *(see Circular 0040/2016)*. They should use the teaching and learning section of *Looking at Our School 2016: A Quality Framework for Post-primary Schools* in Chapter 3 of the revised *School Self-Evaluation Guidelines* as a benchmark when reflecting on and evaluating their current practice and to identify the domain most relevant to their school – *Domains and Standards are summarised below.*

Domain / Standards

Learner outcomes
- Attitude to learning
- Understanding of themselves and others
- Acquisition of curriculum knowledge & skills
- Levels of attainment

Learner experiences
- Levels of engagement as learners
- Growth as learners
- Self-reflection & ownership as learners
- Development as life-long learners

Teachers' individual practice
- Teachers' knowledge & skills
- Use of practice that progress students' learning
- Use of appropriate teaching approaches
- Responsiveness to individual learning needs

Teachers' collective/collaborative practice
- Teachers' value & engage in professional development & collaboration
- Co-operation to extend students' learning opportunities
- Collective use of dependable formative and summative assessment practices
- Sharing of expertise to build capacity

Step 2 – Gather Evidence
Chapters 4 and 5 of the SSE Guidelines 2016-2020

Always consider – relevance, simplicity & clarity, efficiency, protocol and validity of qualitative and quantitative evidence gathered.

Schools may decide to analyse assessment data and records of student progress as a starting point.

Teachers' views and their records (assessment, uptake at foundation, ordinary and higher level in specific subjects and attainment in state examinations) are useful examples of evidence.

Schools should gather information from students and parents to ensure that they have sufficient knowledge to make accurate judgements.

Professional reflection and dialogue between teachers, focusing on specific aspects of teaching and learning, are very important when gathering evidence.

As collaborative practices are further developed among the teaching staff, team teaching and professional collaborative review will become an effective means of gathering evidence.

Sample tools to support the effective gathering of evidence may be accessed at **www.schoolselfevaluation.ie** and should be adapted to suit the particular context of each school.

Step 3 – Analyse and Make Judgements
Chapter 4 of the SSE Guidelines 2016-2020

EFFECTIVE ⟷ HIGHLY EFFECTIVE

Evaluate the effectiveness of your current practice using **statements of practice** on pages 15 to 21 of the *SSE Guidelines 2016-2020*.

Using the statements as a benchmark, schools can evaluate their own practice and make sound judgements based on the evidence they have gathered. Schools will naturally aspire to very effective practice, but should in the first instance compare their findings to the statements of effective practice. In this way, they can identify existing strengths as well as possible gaps or weaknesses. Then, by considering the statements of highly effective practice, schools can build on existing strengths and work towards excellence.

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Step 4
Write and Share Report and Improvement Plan

Chapter 6 of the SSE Guidelines 2016-2020

Typically, the school self-evaluation report and improvement plan should be a **single document** of no more than three pages in length. Normally, it should be completed once annually. A template for this document is available on **www.schoolself-evaluation.ie**.

The first section of the document is the **report** and should outline:
- An account of progress that has been made on implementing improvement in areas that were the subject of evaluation and improvement plans in the previous year
- The new aspect of teaching and learning chosen for self-evaluation, where relevant
- The areas that the school has prioritised for improvement

The second section of the document is the **improvement plan** and should contain:
- Targets for improvement with a focus on learner outcomes (*The setting of specific targets is the starting point. Having formed a judgement based on the relevant information or evidence, a school will be in a position to decide on specific, measurable, attainable, realistic and time bound (SMART) targets to bring about improvement. This is an important step in determining the actions that need to be taken).*
- The actions that are required to achieve the targets over three years
- Reference to who will undertake the actions outlined
- Reference to who will monitor and review the implementation and progress
- Reference to how parents can help
- A timeframe for the achievement of the targets

The final part of this step asks schools to share a **summary** of the self-evaluation report and improvement plan with the whole school community.

Note re: DEIS schools: The school's DEIS action plan is its school improvement plan for the purposes of school self-evaluation, and no additional or separate improvement plan is required.

Step 5
Put Improvement Plan into Action

This is **the key step in the process**. It is only when the actions in the improvement plan are implemented that the work of the school can improve. All relevant school personnel should share ownership of the actions to be implemented at individual teacher, subject department, or whole-school level. **These actions should become part of the normal teaching and learning process.**

Step 6
Monitor Actions and Evaluate Impact

In order to evaluate the impact of the actions, they must be monitored. A number of questions are useful when considering this:
- Has practice changed in classrooms?
- What are teachers' experiences of the agreed changes?
- What are students' experiences of the agreed changes?
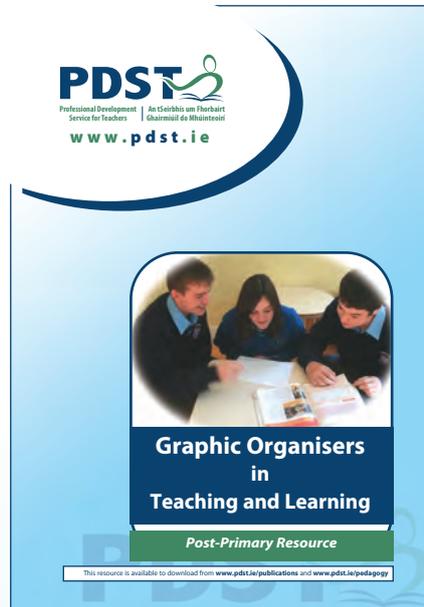
Schools will need to decide:
- How monitoring will occur
- Who will be responsible for monitoring
- How progress will be determined and reported
- When and to whom progress will be reported (for example, at staff meetings, planning meetings, board meetings)
- If targets and actions are realistic or need to be changed

The role of those leading the process, and the role of all teachers, in the ongoing and systematic monitoring of the implementation of the plan is important. In this regard, the gathering and use of information at specified intervals to check if the required improvements are being made is necessary. The implementation of the school improvement plan ultimately leads to a new cycle of school self-evaluation.

The graphic below (taken from page 3 of Circular 0040/2016) sets out how the process would work over a four-year period in which a school selects three aspects of teaching and learning. For *illustrative purposes only*, it provides examples of how aspects of the Framework for Junior Cycle can be implemented through the self-evaluation process. Schools should refer to Circular 0024/2016, *Arrangements for the Implementation of the Framework for Junior Cycle*, for specific requirements.

Literacy and numeracy practices embedded, with regular review – 2016-2020

	Investigation year	Implementation year	Consolidation year	Review year
Assessment practices	2016/17	2017/18	2018/19	2019/20
Teaching and learning the key skills	2017/18	2018/19	2019/20	
Engagement in learning	2018/19	2019/20		

* The four year period allows for an investigation year for scoping out and developing the improvement plan, and preparing for its implementation. However some schools may feel confident that they can implement an improvement plan without a preliminary investigation year, for example where baseline data is already available and the actions required are clear.

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Graphic Organisers in Teaching and Learning

Post-Primary Resource

This resource is available to download from **www.pdst.ie/publications** and **www.pdst.ie/pedagogy**

See 'Graphic Organisers in Learning, Teaching and Assessment for further details and templates.
Available to download from: www.pdst.ie/publications

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