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Professiona Deve opment
Service for Teachers | An tSeirbhís um Fhorbairt
Ghairmiúi do Mhúinteoirí

An Roinn Oideachais
Department of Education

Agricultural Science Hexagonal Thinking Digital Toolkit

Using the Hexagonal Thinking Digital Toolkit

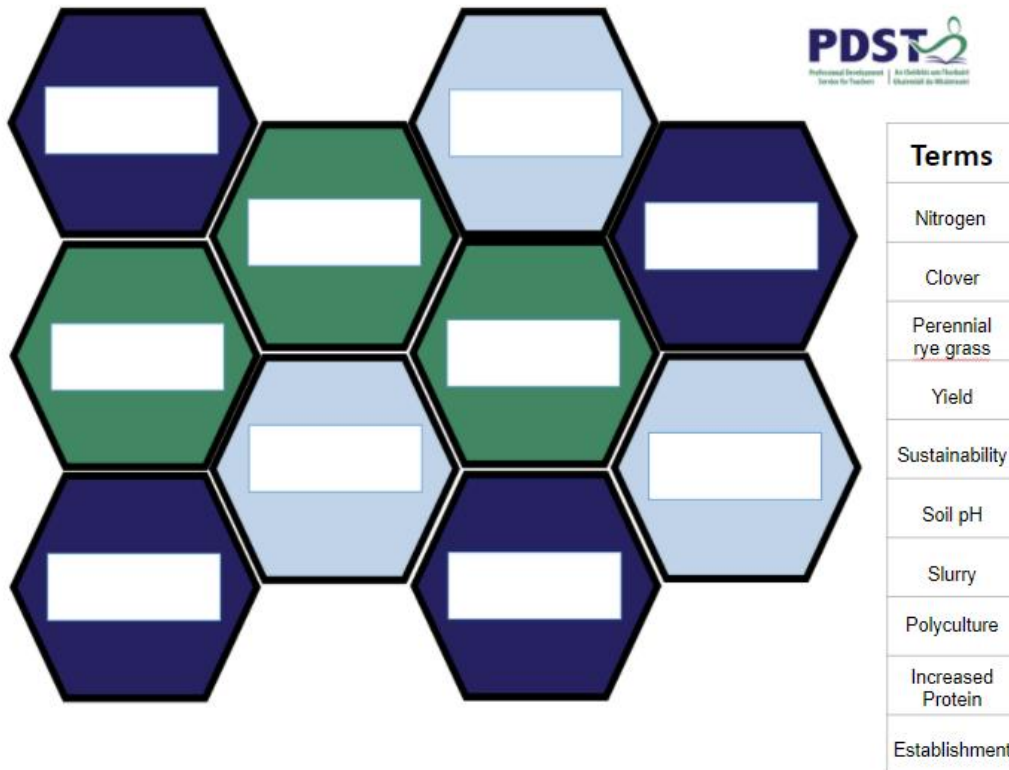Hexagonal thinking is a simple method that yields big critical thinking results.

Students take a set of hexagons with varied terms, concepts, themes, real-world connections, etc. that relate to their current unit of learning and link them together into an interconnected web. **In pairs, groups, or even alone, students must use their critical thinking skills to decide which hexagons link best to which others.**

This can be done with paper hexagons or with hexagons online.

The key, in the end, will be that students are able to explain and argue for the order they have placed their hexagons in. They can write about key connections, fill in and place connection arrows, or present back to the class about their choices.

In this toolkit, you'll find the moving parts you need to get started with digital hexagonal thinking in your class.

Using the Hexagonal Thinking Digital Toolkit

Terms
Nitrogen
Clover
Perennial rye grass
Yield
Sustainability
Soil pH
Slurry
Polyculture
Increased Protein
Establishment

To use this template:

1. Create your list of terms by clicking into each term box and changing the moveable text.
2. Students will drag and drop the terms, but not the hexagons.
3. Copy the instructions, template with terms, and explanations slide into a new series of slides for students.
4. Students copy their final webs into a collaborative slideshow so everyone can see everyone else's webs.
5. If time allows students can present webs to class.

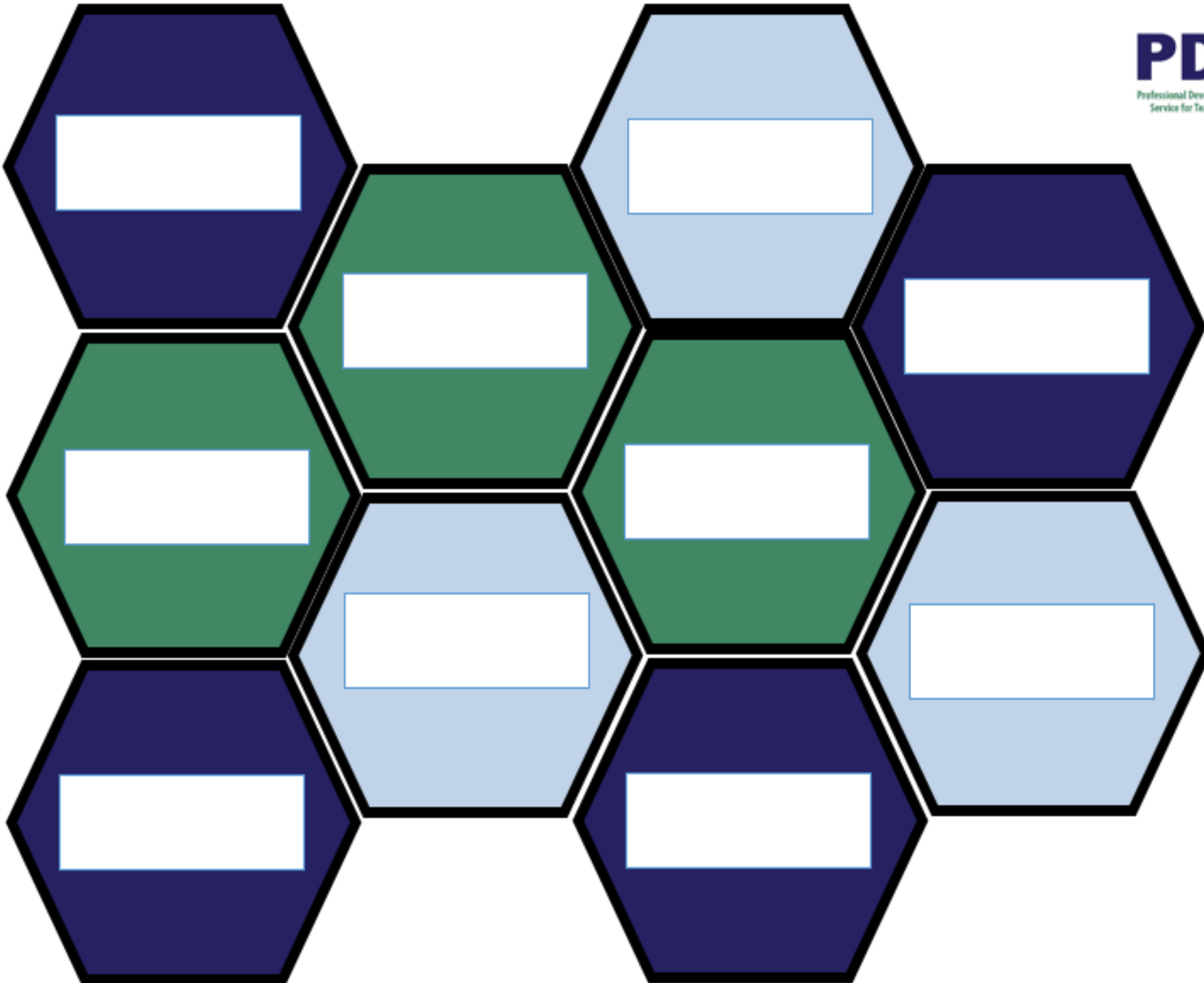# Hexagonal Thinking Instructions

#1 Create your Web of Ideas

You connect terms and ideas through the sides of each hexagon. A hexagon has six sides, therefore each term or concept CAN connect to up to six others. Use your critical thinking to decide where the terms you have been given best fit in the web of hexagons provided.

Your goal is to drag / place each term to the position where it BEST fits within the overall web. You could connect any given term to several others, but be intentional with your placement. Make the most important connections your priority. You will not use every hexagon. Leave gaps where it makes sense.

#2 Explain your Connections

Once you've decided where each concept should go, you should be ready to explain its placement. Choose five / six of your most significant connections and explain each one with a paragraph.

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Sustainability

Soil pH

Nitrogen

Establishment

Yield

Clover

Perennial rye grass

Increased protein

Slurry

Polyculture

Terms

Explain Your Thinking Here

Connection # 1 **Clover + Nitrogen**	By adding clover to a sward, it has the ability to fix atmospheric nitrogen to nitrates (form usable by plants) using *Rhizobium* bacteria in the root nodule of clover. Also by spreading too much chemical nitrogen on clover swards it can kill it, so reduction of chemical nitrogen is required.
Connection # 2 **(Nitrogen + Sustainability + Yield)**	Nitrogen is an essential macronutrient for plant growth and is a key component of the chlorophyll molecule and amino acids which form building blocks of plant proteins and enzymes which are essential for plant growth and hence increased yield. By reducing the amount of chemical fertiliser used and replacing it with natural nitrogen (from *Rhizobium* bacteria in clover) is increases the sustainability of the farm.
Connection # 3 **(Slurry + Yield + PRG)**	By adding slurry to a field of PRG in early spring it will maximise grass growth and hence increase the yield of PRG. Slurry contains N, P and K which are all essential nutrients in producing high quality grass. Slurry should be spread using low emissions slurry spreading (LESS) to maximise nutrient uptake and minimise losses to the environment.
Connection # 4 **(PRG + Clover + Polyculture + Increased Protein)**	By increasing the number of crops sown in a sward increases the soil health, increases biodiversity, better uptake of nutrients so less leaching, decreased chemical use (fertiliser, pesticides or herbicides) and increased productivity. By adding clover to the sward it will increase the protein content which will increase LWG in animals and increase milk protein.
Connection # 5 **(Nitrogen + Clover + Establishment + Soil pH)**	

Where to find out more information

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1. For further resources free to teachers go to(see slides 9-14 for some examples of templates provided:

https://nowsparkcreativity.com/free-hexagonal-thinking-digital-toolkit

2. For a video on the benefits of using Hexagonal Thinking in your classroom click:

https://www.youtube.com/watch?v=c88LmOC86D8

3. For a video explaining how to adapt Hexagonal Thinking for use in an online space such as Google Classroom click here:

https://www.youtube.com/watch?v=6BSxQepDY7k

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Explain your Thinking Here

Connection #1 (term + term):

Connection #2 (term + term):

Connection #3 (term + term):

Connection #4 (term + term):

Connection #5 (term + term):

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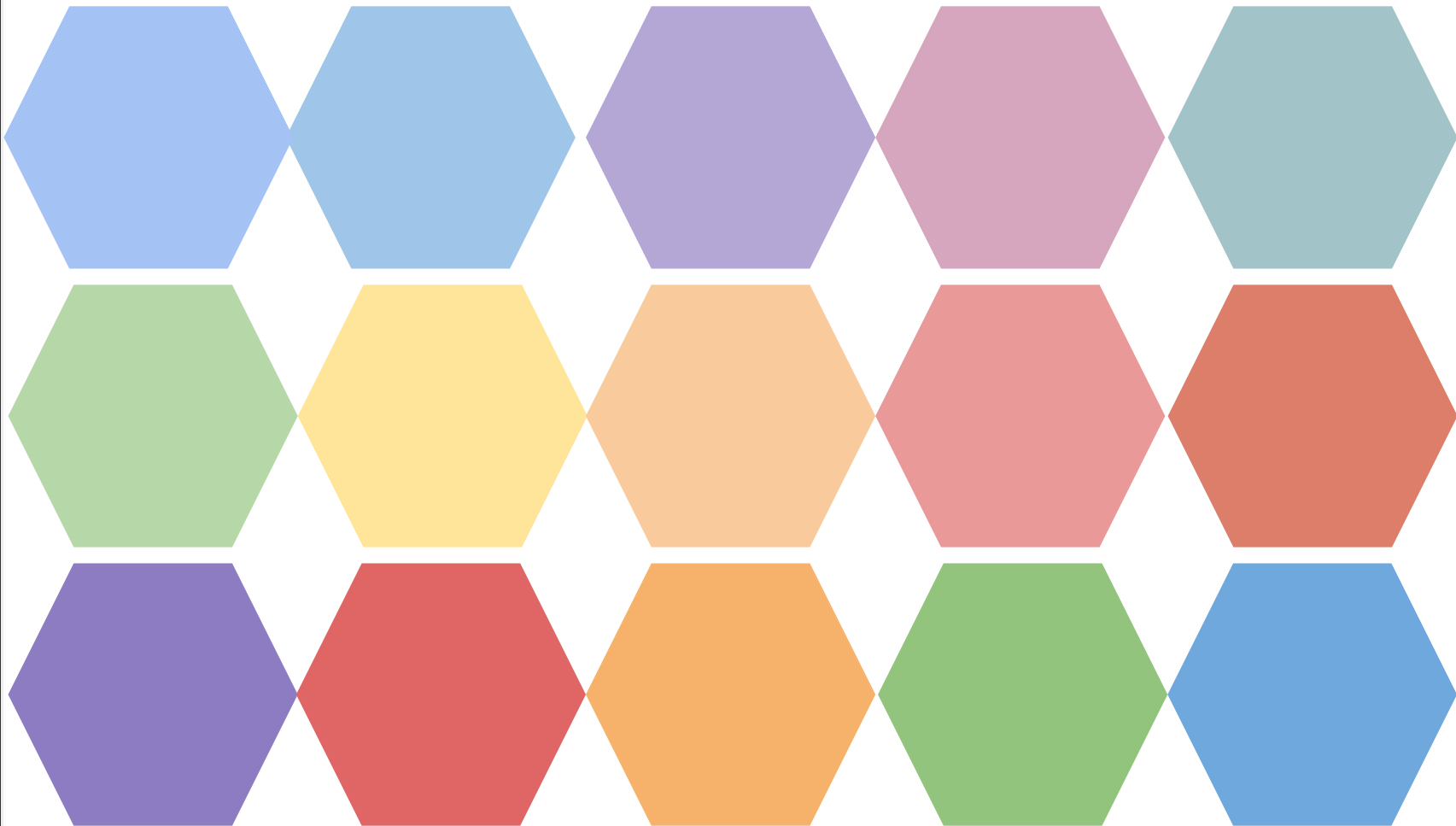
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#1   #2   #3

#4   #5

Explain your Thinking Here

Connection #1: :

Connection #2:

Connection #3:

Connection #4:

Connection #5:

TERMS
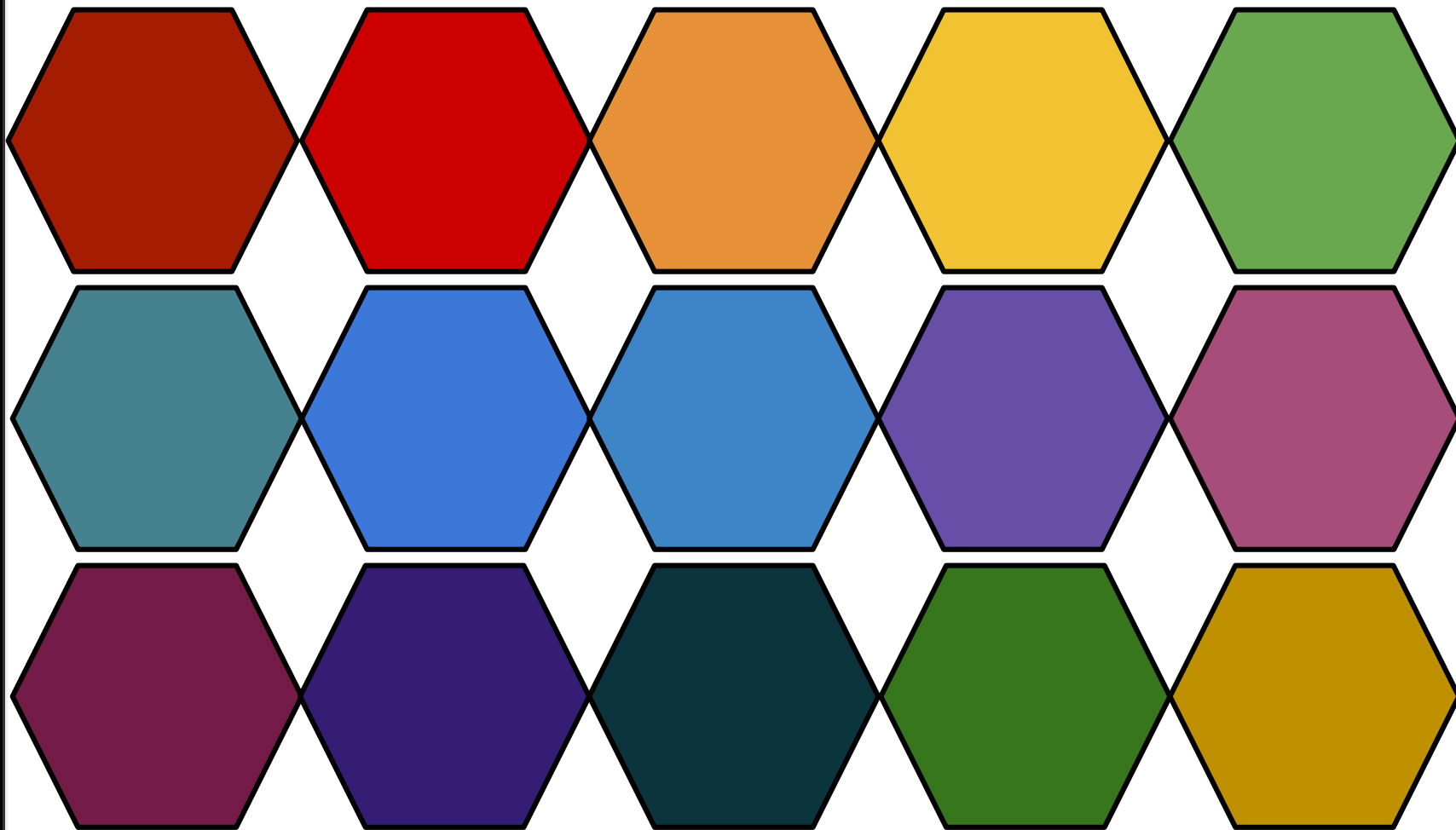
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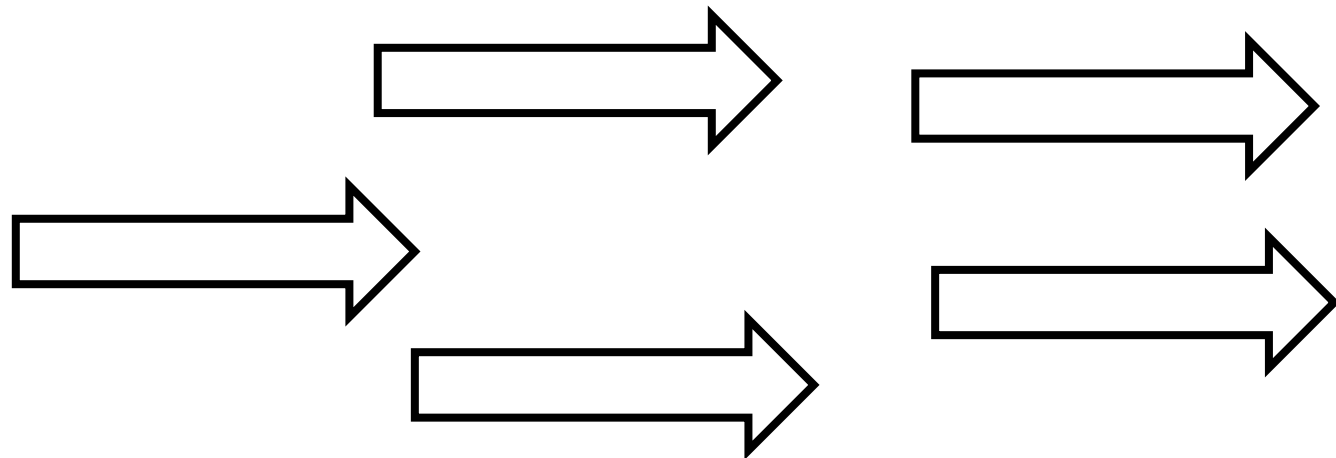
ONE
TWO
THREE
FOUR
FIVE

I'm so glad you stopped by
SPARK CREATIVITY!

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The Ed Deck

THE SPARK CREATIVITY TEACHER PODCAST

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For questions about anything and everything, you can contact me at betsy@nowsparkcreativity.com .