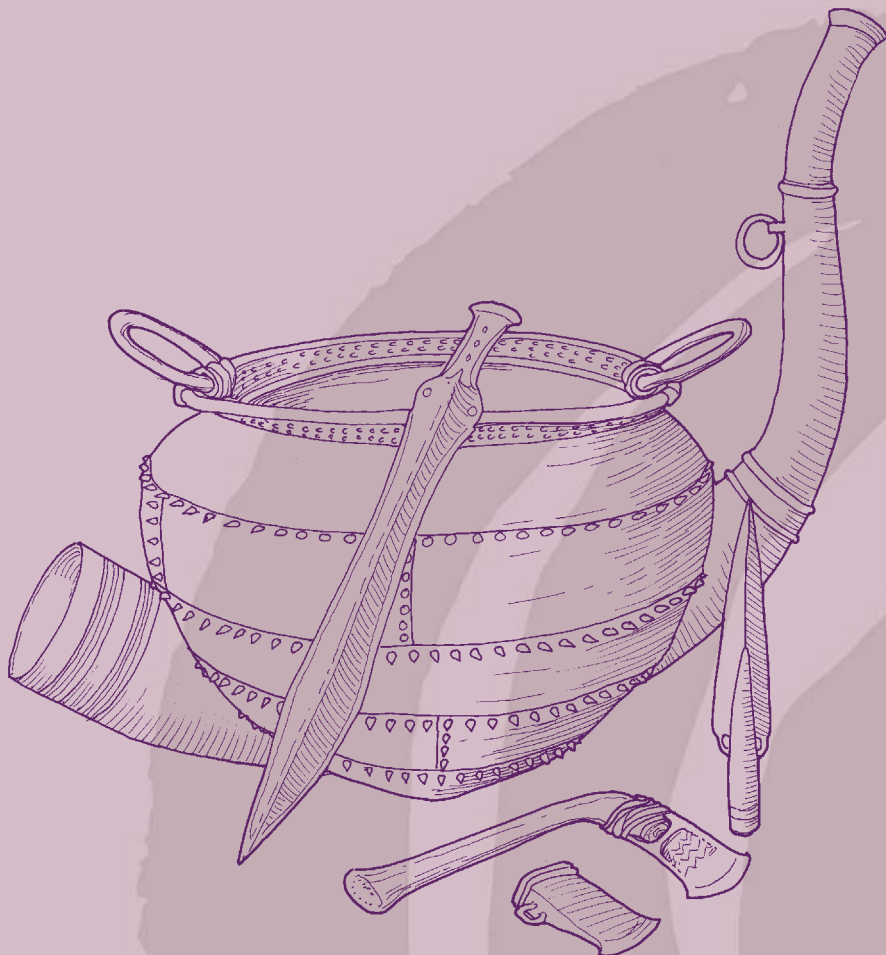


Excavation

LESSON 1

Excavation: What's it all about?



ARCHAEOLOGY
time in transition

IT'S ABOUT TIME 2

**Aim(s)**

To give an understanding of archaeological excavation.

**Objective(s)**

To lead the students to an understanding of how valuable information lies buried in the ground and how through archaeological excavation this information can be uncovered.

**Time Period**

The Bronze Age (2,000 BC to 500 BC).

**KEY INFORMATION****Lesson**

- Archaeology is the study of past cultures through the analysis of the material remains they have left behind.
- Material remains consist of monuments and artefacts.
- Reconstruction of a Bronze Age settlement.
- All known archaeological monuments can be found in the Sites and Monuments Record (SMR*).
- An archaeological excavation involves the systematic removal and recording of layers of soil along with any features (walls, burials, pits etc) and artefacts found in each layer.

*The Sites and Monuments Record (SMR) contains a record of all known archaeological monuments (www.archaeology.ie). In 1998 the Record of Monuments and Places (RMP) was issued which provides for statutory protection under section 12 of the National Monuments Act 1994.

Context

In the Bronze Age

- The countryside was heavily forested in comparison to today.
- Most people lived in farming communities scattered throughout the countryside.
- People lived in circular houses made of wood with conical thatched roofs.
- This age is in prehistory—no written evidence exists for this period.

**METHODOLOGY & MEDIUM**

- Instruction
- **Worksheet 1a** Bronze Age Landscape
- **Worksheet 1b** Bronze Age Landscape 2,000 BC - 500 BC
- **Worksheet 1c** The Landscape Today
- **Worksheet 2** Excavation Record Sheet
- **Student Handout** Excavation: What's it all about?
- Materials required: Packet(s) of chocolate chip cookies (enough for 2 per pupil)
Paper clips, Paper plates, Small plastic bags

**SECTIONS**

- Section 1** What is Archaeology?
- Section 2** Bronze Age Settlement
- Section 3** Activities and Artefacts
- Section 4** The Archaeology of the Bronze Age Landscape
- Section 5** Classroom Excavation
- Section 6** Archaeological Excavation

**Key Question(s)** What is archaeology all about?

Archaeology is the study of past cultures through the analysis of the material remains they have left behind.

Material remains: *monuments* and *artefacts*.

- A *monument* is part of the landscape.
- An *artefact* is a portable object.

The study of archaeological monuments is a way of finding out about the past

- Stone Circles—How did people worship in the Bronze Age?
- Castles—How did people defend themselves in medieval times?

We tend to think of archaeological monuments as visible features on the landscape, like a stone circle or a castle. In fact there are many archaeological monuments that are no longer visible on the surface but where valuable information lies buried in the ground. The landscape is continually changing with each generation eroding traces of those who have lived before them. Nature can also lend a hand, like the great bogs that covered the Stone Age field systems in north Mayo (Céide Fields).

**Teacher Instruction**

Distribute **Worksheet 1a** Bronze Age Landscape.

- The scene is a reconstruction of a Bronze Age Landscape (c. 1,500 BC) showing a settlement in the foreground.



The settlement is surrounded by dense deciduous woodland. A lot of Ireland was cleared of woodland with the introduction of farming c. 4,000 BC but large stands of natural woodland still survived. The most common trees in Ireland at this time were pine, oak, birch and hazel. Also present were alder, willow, elm, yew and ash.



Key Question(s) What monuments are present in this Bronze Age Landscape?



Teacher Instruction

Ask the students to identify and describe the monuments (man-made features) in the scene. Use **Worksheet 1b** to record their answers.

- There are three houses: these are circular with conical thatched roofs (probably wheat or oat straw). The roof is supported by timber posts set into post holes. There are wattle-and-daub walls. There is smoke coming out through a smoke-hole in the roof. The fire is in a hearth built into the ground in the centre of the floor.
- This grouping of three houses suggests a settlement consisting of an extended family group, probably farming the area immediately surrounding the settlement. Another group of houses in the distance is a neighbouring settlement.
- A circular enclosure surrounds the three houses. This consists of a wooden palisade on a low earthen bank with an external fosse/ditch. This provides a basic form of protection for the settlement.
- Stone Circle—how many stones are there? Two entrance stones form an entrance at the north-east side; the stones decrease in height around to the axial stone at the south-west side. This is where the local farming community gather to celebrate at certain times of the year, like the mid-winter solstice (see *The Magic Ring*, T1,U1,L1).
- Fulacht fia—a low kidney-shaped mound formed of discarded heat-shattered stones. Meat was cooked in a pit and water boiled by placing hot stones into it. The fire is burning suggesting that cooking is taking place.
- Road/trackway.
- Togher—trackway made of wooden planks across wet ground.
- Wooden bridge.
- Clay kiln for firing pots.
- Barrow burial—probably the burial place of some important person (possibly a local ruler).
- Fields and field boundaries.
- Cairn burial on top of the hill—the top of a prominent hill was a popular place for burial mounds in the Bronze Age.



Key Question(s) What activities and artefacts are present in this Bronze Age landscape?



Teacher Instruction

Ask the students to list the activities shown in the illustration and record their answers in **Worksheet 1b**.

- Chopping wood.
- Fishing.
- Cooking
 - a cauldron is over the fire near the houses.
 - there is a fulacht fia with an open fire.
- Curing animal skins.
- Drying food.
- Farming: ploughing; herding and tending cattle; sheep and pigs; cereal cultivation and harvesting (wheat, barley and oats); clearing fields.
- Hunting with spears and bow-and-arrows.
- Firing clay pots.
- Collecting clay and mud near the river using an ox and cart (mud to plaster the wall of the house (daub); clay to make pottery).

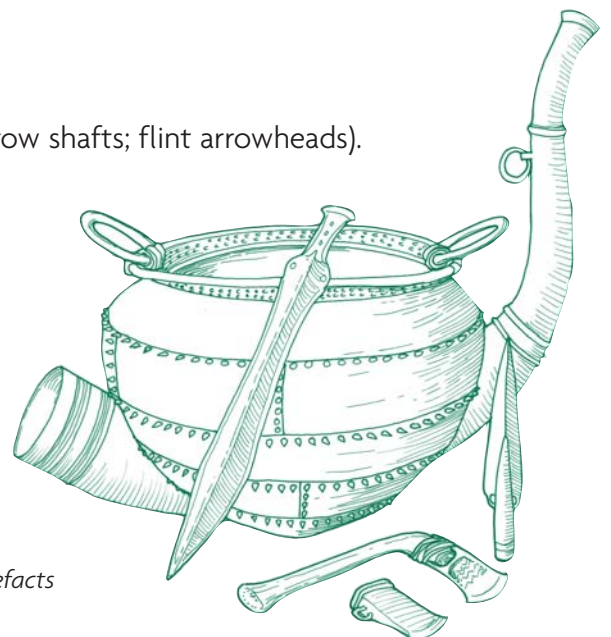


Teacher Instruction

Ask the students to list the artefacts shown in the scene and discuss the material they are made from. Record their answers on **Worksheet 1b**.

What is the likelihood of their survival in the ground over a period of four thousand years?

- Axe—may be stone or bronze.
- Wooden plough.
- Wooden boat and paddles.
- Bronze cauldron.
- Clay pots.
- Timber cart.
- Bow-and-arrows (wooden bows and arrow shafts; flint arrowheads).
- Spear (the bronze spear head).
- Bronze sickle for cutting corn.
- Fishing net.



Bronze Age artefacts



Teacher Instruction

Discuss with the students what other types of artefacts may be present in the scene but are not visible to us

- The fishing net could have stone weights attached to hold it down in the water.
- Wooden buckets and bowls used for storing food and cooking.
- Variety of wooden, bronze and stone tools for farming.
- Woodworking tools made of bronze: axe; gouge; chisel etc.
- Bronze weapons: swords; shields; spears etc.
- Personal ornaments—necklaces; bracelets etc.
- Woollen fleeces for clothing and bedding.

Many beautiful ornaments were made during the Bronze Age, such as gold lunulae, torcs, gorgets (neck collars) and bracelets.

It is unlikely the gold ornaments were commonly used; simpler ornaments (possibly made from shells or animal bone) are more likely to have been worn in everyday life (see *Artefacts of Living* T2,U4,L2).



Gold lunula



Bronze bracelet



Teacher Instruction

Discuss with the students the various reasons why a settlement like this might be abandoned

- Force—new people arrive and take over the area.
- Soil exhaustion—due to over farming the earth loses fertility.
- Famine—failure of the harvest; no food for animals.
- Disease—can wipe out a community (or their food supply).
- Climate change—there is some evidence that Ireland became a wetter and colder place after c. 1,000 BC.

The first reason suggests that we can expect new settlements to be built in the area. If the new arrivals are from a different social or cultural group we may expect to find a different type of ritual and burial monument. In the latter four reasons, the area may be re-colonised by woodland or bog. There is ample evidence from pollen cores of periodic woodland regeneration during prehistoric times, with areas that were once farmed subsequently covered by woodland or bog.

**Key Question(s)** What survives today?

- Today, roughly 3,500 years later, what might survive of this settlement?
- What might survive above ground as visible monuments and what might be buried below ground. Record answers in **Worksheet 1b**.

**Teacher Instruction**

Ask the students to identify which features in the reconstruction drawing might survive today as visible archaeological monuments. Write the monuments on the board.

- Stone Circle.
- Fulacht Fia.
- Ring Barrow.
- Cairn (burial mound of stones) on hill.
- Enclosure.
- The Stone Circle has a good chance of survival as it is clearly a 'ritual' monument and traditionally people are very slow to interfere with such structures from the past for superstitious reasons, even if they no longer understand their original function.
- Many ringforts have survived because it was believed that levelling them would bring bad luck.
- The location of a monument can also be a factor in its survival. A cairn on a hilltop is unlikely to be removed for agricultural reasons, whereas a low mound in good agricultural land is more likely to be levelled and ploughed over.

What man-made features are unlikely to survive upstanding in the landscape?

- Wooden houses.
- Wooden palisade fence.
- Wooden fence around the small field.
- Pottery kiln.
- Togher-wooden trackway.
- Wooden bridge.

However, depending on soil conditions, evidence for some of these features may survive in the ground. In wet anaerobic conditions the wood itself may survive, but in most cases it is the 'impression' these features make in the ground (stake holes, post holes, slot trench, etc.) which survive. The only way to recover this evidence is through the process of archaeological excavation.

The survival of artefacts in the ground depends mainly on two factors

- The material it is made from.
- The condition of the soil in which it lies.
 - Organic material will tend to rot away quickly (wood, thatch, wool etc.) unless deposited in waterlogged conditions.
 - Inorganic material (stone, bronze, ceramics etc.) has a much better chance of survival in the ground.

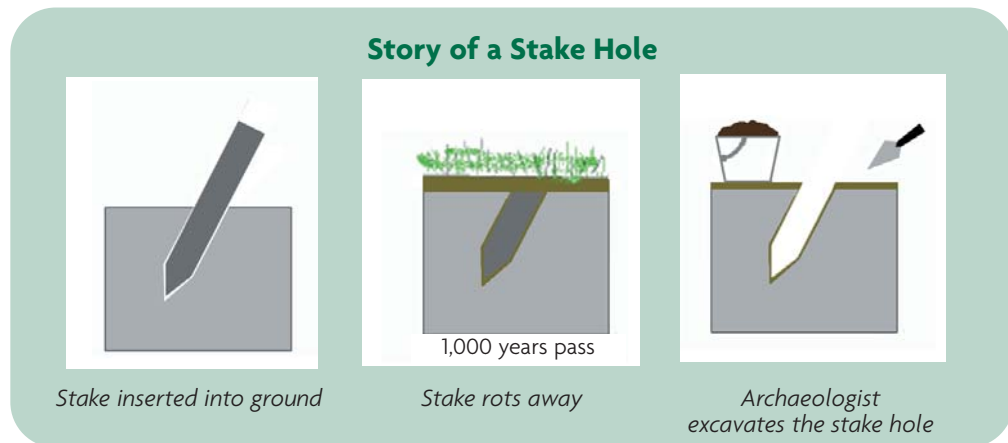


Another factor which determines the survival of an artefact is its 'value'. Unless it is lost, anything made of gold, silver or precious stones will either be passed on from one generation to the next or else melted down and turned into something new. On the other hand items like broken pots or animal bones left over after cooking will be thrown away or dumped into a rubbish pit. Most of the artefacts archaeologists find in excavations are waste items like these.



Teacher Instruction

Remind the students how a stake hole or post hole survives in the ground (see *No Place Like Home*, T2,U1,L1).



- An archaeological excavation is the systematic removal of layers of soil, along with any features (post holes, graves, pits etc.) and artefacts found in the soil, and the detailed recording of this process.
- All information gathered is recorded in great detail, studied and the information gathered is written up in an excavation report.



If an excavation is not fully written up in a satisfactory report the archaeologist in charge will not get another excavation licence from the State. Preliminary reports on all excavations are available at **www.excavations.ie**.

SECTION 5 Classroom Excavation



Key Question(s) What are the basic principles of archaeological excavation?

Excavation of a Chocolate-Chip Cookie



Teacher Instruction

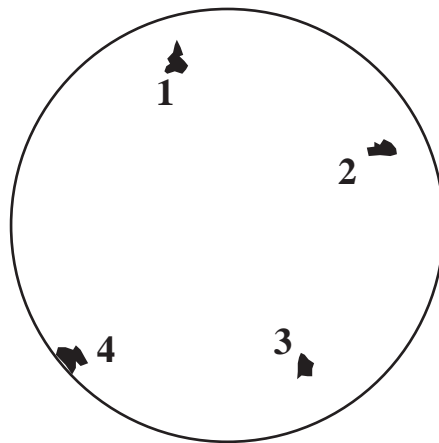
- Distribute **Worksheet 2**, two chocolate chip cookies, a paper plate and a paper clip, to each student.
- Give each student a different number for their excavation—e.g. the name of your school and a number 1, 2, 3, 4 etc.
- Ask the students to place one cookie on the plate, place the 2nd one on top.



The number of the excavation relates to the licence given by the State to the archaeologist. All archaeological excavations have to be licensed by the State.

- Each cookie represents a layer of soil—this is called stratigraphy.
- The bottom cookie is the older layer as it was laid down first—this is one of the key principles of archaeological excavation—in general, the layers get older as you go deeper.
- The top cookie represents the topsoil sod so it can be taken off as it contains no archaeological information.
- The layer underneath is of archaeological interest and some features (chocolate chips) are visible on the surface. These need to be excavated:

The first thing an archaeologist will do, before starting to excavate, is to draw a plan showing the location of all visible features.



Plan drawing of chocolate chip cookie. Scale 1:1



Teacher Instruction

Ask the students to draw in plan the upper surface of the cookie onto **Worksheet 2** at a scale of 1:1 (actual size) and mark the location of all the visible features (chocolate chips).

1. Give each feature a *context number*.
2. Now the excavation can begin. Demonstrate to the students how to open the paper clip and use the end to gently excavate the chocolate chip without breaking the biscuit. Ask the students to excavate one of the features (a chocolate chip in their own cookie). Advise them not to get 'spoil' (waste cookie crumbs) everywhere—the management of excavated soil is an important feature of an archaeological excavation.
3. Get the students to place their excavated 'feature' in the plastic bag and label the bag with the number of the excavation, the context number of the excavated feature and the excavator's name.
4. Fill in **Worksheet 2, Excavation Record Sheet**.



The students will note there are a lot of crumbs created while digging out the chocolate chips. This is 'spoil' that has to be carefully disposed of. The removal of soil that has been excavated is a constant chore on archaeological excavations but needs to be properly organised or else the excavation becomes messy and unproductive. Most excavations have a 'spoil heap' where unwanted soil is disposed of.

The students can now excavate all the other features (chocolate chips), as above, and write the context numbers on the bag as they are added to it.



Health and Safety

Do not let the students eat the excavated cookie. Dispose of it correctly.



Preservation in the Soil

The preservation of artefacts in the soil depends on a number of variables. The most important is the nature of the artefact itself, whether it is organic or inorganic.

Organic material is more vulnerable to decay. In soil conditions where oxygen, warmth and moisture are present, organic materials (e.g. wood, food, natural textiles, leather, paper, the soft tissue of humans and animals) are quickly broken down by bacterial action. If any of these three influencing factors (warmth, moisture or oxygen) are absent there is a far greater chance of preservation, as on permanently frozen, waterlogged (bog) or desert conditions.

If the boat and paddles in the illustration sank into the river they will be preserved in the anaerobic conditions of the riverbed. The tougher timber and wooden foundations of the bridge may also survive if they are left in wet ground. Other factors that influence preservation is whether the soil is acidic or alkaline, and subsequent human activity like ploughing, quarrying, building etc.

SECTION 6 Archaeological Excavation



Key Question(s) Why Excavate?

Excavation is the key method used by archaeologists to gather information about buried deposits. It can be an expensive process as much of the work is done by hand.

- An archaeological excavation is carried out by a team, lead by a director.
- The director is a trained archaeologist who is licensed to excavate that site by the Department of Arts, Heritage and the Gaeltacht.

There are two basic reasons for carrying out an archaeological excavation, but in either case the standards of excavation, recording and conservation are exactly the same.

Research excavation—This type of excavation is carried out primarily for research purposes. It is usually carried out by an academic archaeologist attached to a University. These are funded by a grant from the Department of Arts, Heritage and the Gaeltacht. The Royal Irish Academy's National Committee for Archaeology administers this fund. Recently the Discovery Programme has carried out a series of research excavations (see www.discoveryprogramme.ie).

Excavation in advance of development—Today, this forms the vast majority of archaeological excavations carried out in Ireland. These are conducted to the same high standards as research excavations. The difference is that these excavations are carried out in advance of a proposed development, for example a new motorway. Commercial archaeological companies usually carry out this type of excavation. The excavation is paid for by the developer.



Teacher Instruction

Distribute **Worksheet 1c**. This is a graphical representation of the present-day landscape where the Bronze Age settlement in **Worksheet 1a** is located.

An hotel and golf course is being planned in the area of our Bronze Age landscape. During the planning process for the proposed development, the area concerned, outlined in red, is checked against the Record of Monuments and Places (RMP). This ensures that all known archaeological monuments are avoided and respected by the proposed development.

In this instance two known monuments (stone circle, cairn) would be identified in the vicinity but none within the proposed development area. However, as a result of completing **Worksheets 1a** and **1b** we now know there are many more archaeological features buried in the ground here.



Environmental Impact Statements (EIS).

This is the study of an area by a variety of experts prior to a proposed development. These experts assess the likely impact of the development on all aspects of the site's environment, including archaeology.

The enclosure in the foreground of the illustration has long been ploughed out (levelled) and knowledge of its existence has been lost.

In advance of construction, the area is checked out for potential buried archaeology. This is a condition of the planning permission granted by the Local Authority on a recommendation from the Minister of the Department of Arts, Heritage and the Gaeltacht. This investigation is carried out by a commercial archaeological company and is paid for by the developer.



Teacher Instruction

Ask the students what features of the Bronze Age settlement are the archaeologists likely to find. Record the answers in **Worksheet 1c**.

Houses

- Widely spaced, circular setting of post holes.
- Slot trench for wattle and daub walls, wide gap for door.
- Central fireplace/hearth.

Kiln

- Reddened soil due to high temperatures.
- Noticeable concentration of broken pots.

Fosse

- Dug into subsoil.
- In-filled with layers of different-coloured deposits.

Field Fence

- Line of regularly placed stake holes where uprights stood.

Bridge

- Bases of wooden uprights survive in waterlogged ground (anaerobic conditions—lack of oxygen).

Togher

- Timbers survive in waterlogged ground.

(The barrow is not within the zone of the development—it is not excavated.)

What artefacts might survive in the ground?

- Stone axe.
- Bronze axe.
- Bronze spear.
- Flint arrowhead.
- Sherds of clay pots.
- Bronze spear head.
- Animal bones.

We can now see how archaeologists find out more information about how people lived in the past through the examination of the physical remains they left behind.

See Projects section: Explore how excavation adds to our knowledge of the past.

WEB LINKS**WWW.**

Database of Irish Excavation Reports

www.excavations.ie/Pages/HomePage.php

Excavations and Techniques

www.bbc.co.uk/history/archaeology/excavations_techniques/

National Roads Authority—Archaeological Discoveries

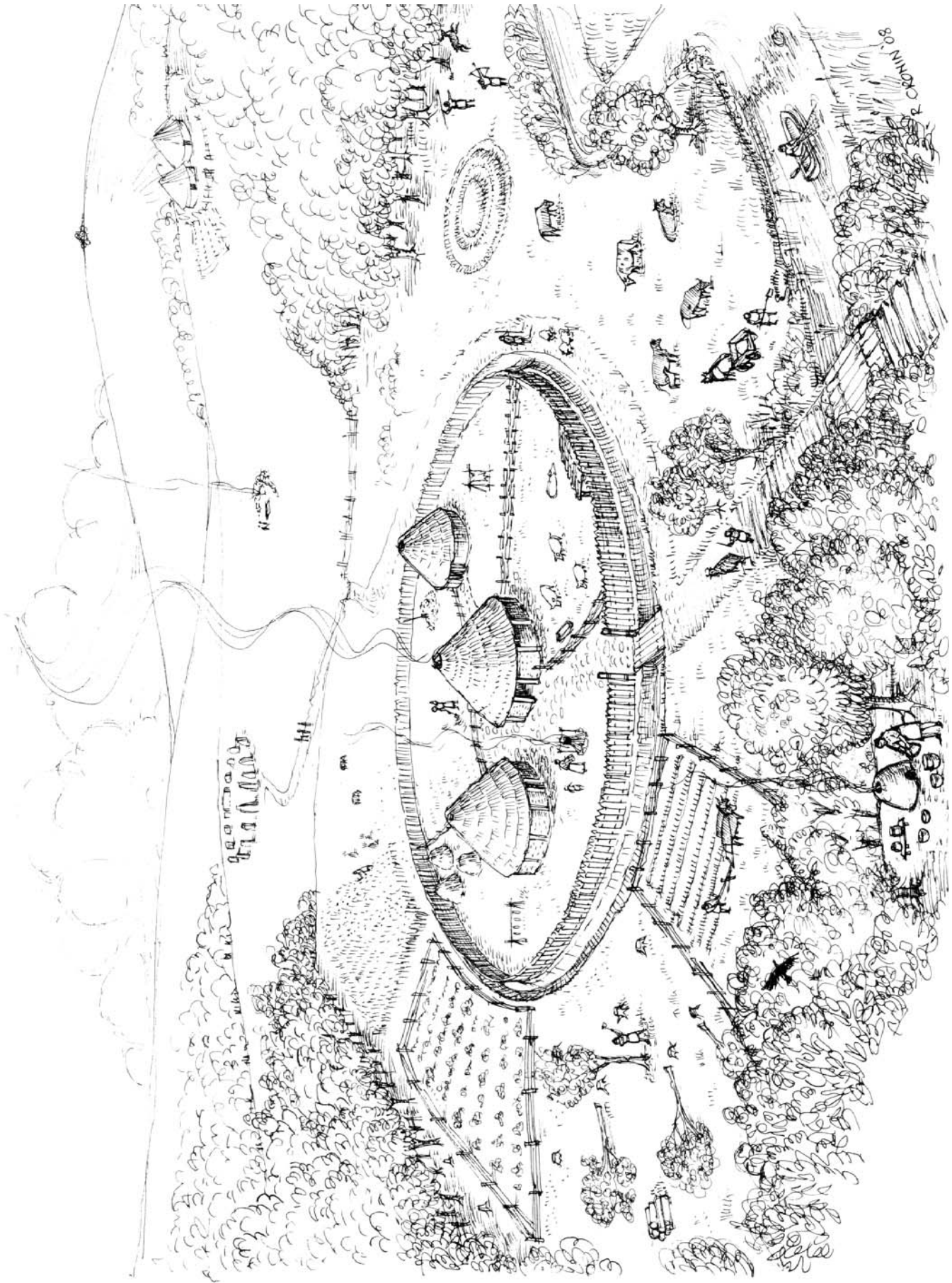
www.nra.ie/Archaeology/BrochureandPosterSeries/

Archaeology—Downloadable Documents

www.nra.ie/Archaeology/DownloadableDocuments/

Excavation at Merrywell

www.m3motorway.ie/Archaeology/Section1/Merrywell1/



1. Describe what you see.

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.....

2. List all the structures and features shown

List the activities shown

List the artefacts

.....
.....
.....
.....

TODAY

3. Circle all the structures/features that are likely to survive upstanding in the landscape today that the Archaeological Survey of Ireland would record. Give them individual numbers and list below.

Monument

What does it tell us about the past?

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.....
.....
.....
.....

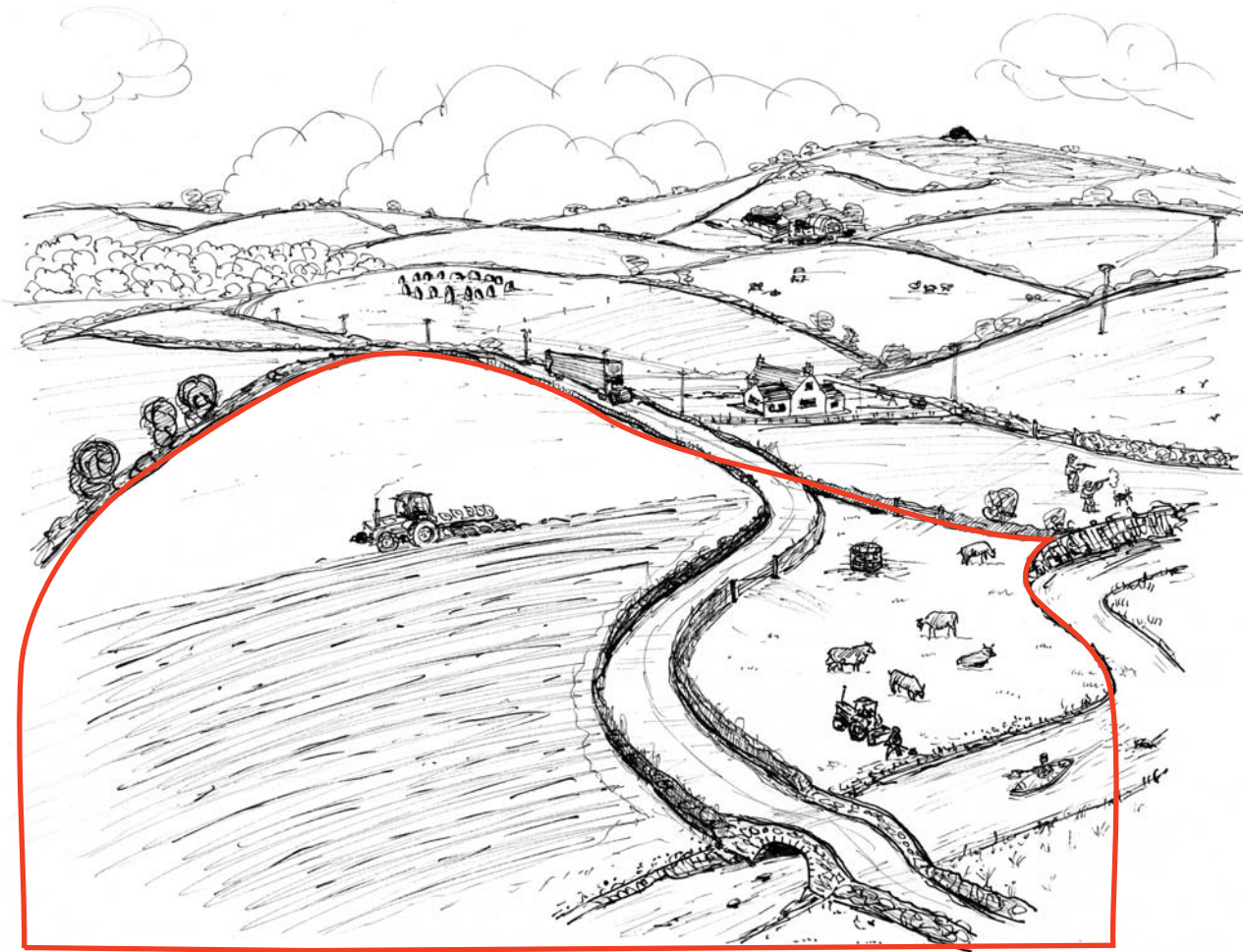
4. A new road is going through this area and all the know archaeological monuments(RMP) are being avoided. Prior to the construction of the road the archaeologist and their team will ensure that all previously unknown archaeology will be uncovered and recorded through archaeological excavation. What will they find in this area?

Structures/features

Artefacts

What does it tell us about the past?

.....
.....
.....
.....



This is the same landscape today with the two archaeological sites visible. These would be identified by the Archaeological Survey of Ireland and listed in the Sites and Monuments Record (SMR) (www.archaeology.ie) and are protected by inclusion in the Record of Monuments and Places (RMP) under the 1994 National Monuments Act. The area of a proposed development is outlined in red.

What archaeological features are hidden in this landscape?

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What features and artefacts of the Bronze Age settlement would the archaeologists excavating within the proposed development area be likely to find?

.....

.....

.....

.....

Excavation Number: _____ Licence Holder (the name of the student): _____

1. Draw a plan of the excavation indicating and numbering the features (chocolate chips).
2. Open the paper clip and gently excavate the artefact (chocolate chip) from the cookie.
3. Place the artefact in the plastic bag provided and label the bag (the label should include the number of the excavation and the excavator's name). Fill in the information required below:

RECORD SHEET

Artefact number: _____ Layer number: _____

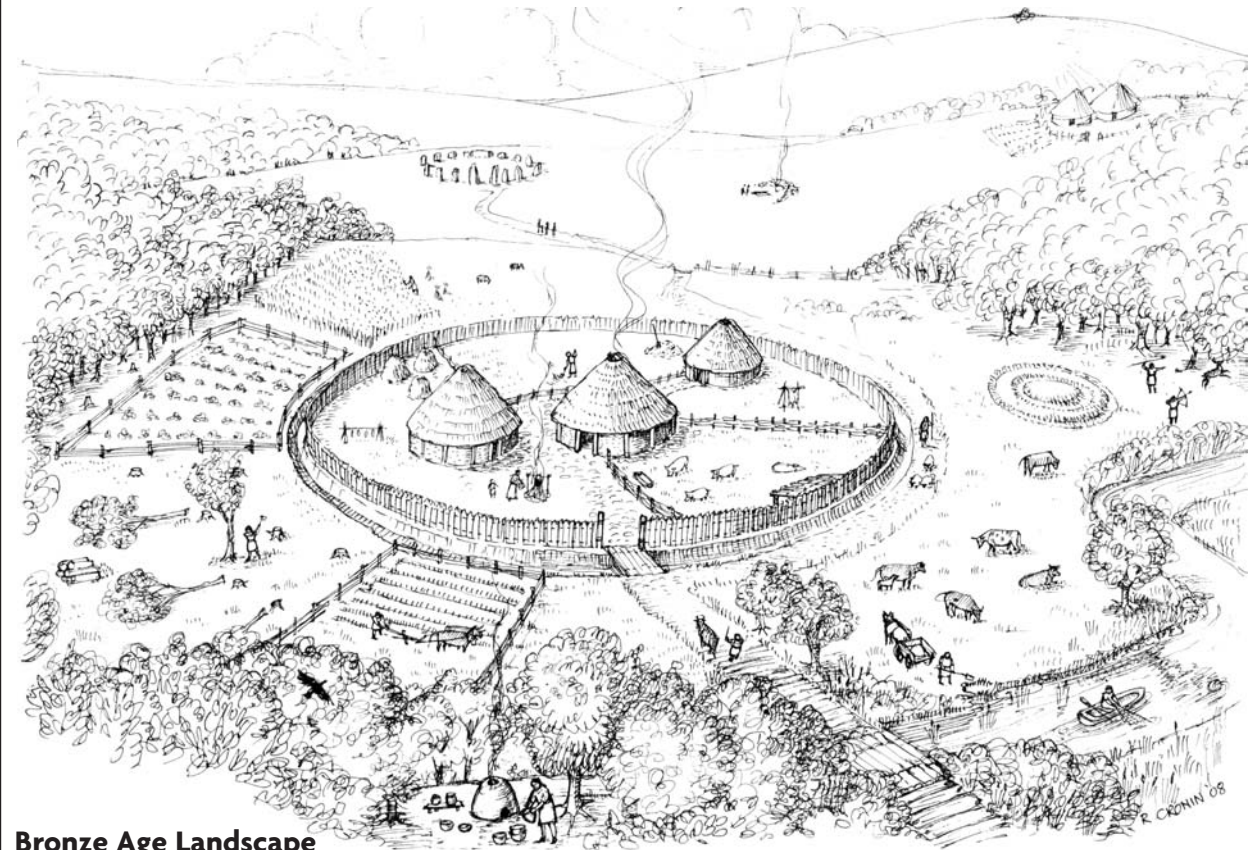
Artefact dimensions : Height _____ Width _____ Depth _____ Colour _____

Draw the artefact

What does it tell us about the owner?

What does it tell us about the society?

Archaeology is the study of past cultures through the analysis of the material remains they have left behind.



Bronze Age Landscape

Monuments: Three Houses; Circular Enclosure; Stone Circle; Fulacht Fia; Road/Trackway; Togher; Wooden Bridge; Clay Kiln; Barrow Burial; Hilltop Cairn; Fields and Field Boundaries.

Activities
Chopping wood
Fishing
Cooking
Curing skins
Wooden frame
Hunting
Firing clay pots

Artefacts
Axes
Net/fish/traps/boat/paddles
Cauldron
Drying food
Farming
Spears/bow & arrows
Ceramic pots
Plough/harness/cat/sickle

Bronze Age artefacts:
cauldron; sword; spear;
axe; ornament.



Monuments surviving today: Stone Circle & Hilltop Cairn (burial covered by a mound of stones)
Ploughed out: Fulacht Fia—may be evident as a black spread when the field is ploughed; Ring Barrow—a faint trace in the grassland
(RMP: Monuments protected under the National Monuments Act 1994)
www.archaeology.ie



Fulacht Fia may be discovered during ploughing or by monitoring top soil removal.



An archaeological excavation involves the systematic removal and recording of layers of soil along with any features (walls, burials, pits etc) and artefacts found in them.

