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| **Lesson Three: Stone Working & Flint Knapping** | |
| This is the first in a series of lessons focusing on how these objects are made. The lesson makes use of a video produced by ARCH of a workshop delivered by an experienced flintknapper and it shows the skill and knowledge required to produce flint objects. While flint knapping is not a part of this lesson it is something the class could try. However, flint knapping is a difficult skill and proper protective equipment is needed and risks of injury need to be considered carefully before attempting it with a class. | |
| **Curriculum Links - Social Subjects (People, Past Events and Societies)** | |
| Experiences and Outcomes | Benchmarks |
| I can evaluate conflicting sources of evidence to sustain a line of argument. SOC 4-01a  I can present supported conclusions about the social, political and economic impacts of a technological change in the past. SOC 4-05a  I can evaluate the changes which have taken place in an industry in Scotland’s past and can debate their impact. SOC 4-05b | * Demonstrates the ability to provide a valid argument on a historical theme. * Provides at least two valid opinions to support  the argument. * Identifies the impact of a technological change with at least one of each: social, political and economic impacts and gives a reason for the conclusion. * Suggests at least three changes which have taken  place in Scotland’s industry. * Provides at least two positive and negative impacts of one of these changes. |
| **Wider Curricular links** | |
| **Social Studies (People and the Environment):**  I can use specialised maps and geographical information systems to identify patterns of human activity and physical processes. **SOC 4-14a**  (I can use a range of maps and geographical information systems to gather, interpret and present conclusions and can locate a range of features within Scotland, UK, Europe and the wider world.  **SOC 3-14a)**  **Technologies (Awareness of Technological Developments; Past, Present and Future):**  I can analyse products taking into consideration sustainability, scientific and technological developments. **TCH 4-05a** | |

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| **Learning Objectives** |
| To identify how different properties of materials can determine the development of technologies. |
| To describe the challenges ancient people experienced in sourcing materials and developing trade routes. |

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| **Resources and Suggested Reading** |
| **Required Resources - Supplied in the boxes or from ARCH website** |
| Objects: Box 1 objects  Information Sheets: Carved Stone Ball object sheet, CT Flint Knapping, CT Stone Pecking, Additional image of Polished Neolithic Stone Axes  Lesson Resources: Object Picture Set, Object Summaries  Other Resources: ARCH Flint Knapping Workshop video ([Link](http://www.archhighland.org.uk/experimental-archaeology.asp)) |
| **Additional Required Resources** |
| Post-it notes, Google maps, British Isles map |
| **Essential Reading - Information sheets supplied in the box or from ARCH website** |
| CT Flint Knapping, CT Stone Pecking |
| **Suggested Additional Reading - Information sheets supplied in the box or from ARCH website** |
| Object information Sheets: Microlith, Scrapers, Flint Blades, Stone Axes, Carved Stone Ball, Barbed and Tanged Arrowheads |

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| **Introduction** | | **15 minutes** |
| **Flint or Not Flint?** (5 minutes) | Resources:  Objects: Stone objects from Box 1 (or Object Picture Set) | |
| * This task is a brief look at the differences between flint objects and those made from other types of stone. | | |
| Stone working in relation to the objects in the boxes comes in two forms: those objects that are made of flint and those made from other types stone.  Display the stone objects from Box 1. Allow the students the chance to study the objects closely.  As *a think-pair-share* exercise ask the students ***What are the common features of the flint objects?*** Colour, shape, sharp edges… are all possible answers they may give. Show the class the flint nodule and scraper. Explain that this is also flint and therefore not all the flint objects are grey. | | |
| **What Are They?** (10 minutes) | Resources:  Objects: Selected stone objects from Box 1  Lesson Resources: Object Summaries Other Resources: Post-it notes, paper | |
| * This task requires the students to look for clues to the objects’ uses - for example the sharp edges on the flint blades suggest they were used like a knife. | | |
| **Caution is needed with some of the flint objects as they are sharp and it is easy for someone to cut themselves if the object is mishandled.**  Form the class into pairs. Hand one of the flint objects to each of the pairs.  Ask the class ***What is your object?***And ***What is it used for?*** Their answers could be recorded on a piece of A4 paper or post-it notes and placed next to the object.  After a short time (one or two minutes) have the groups stand and move to another object; repeat the above process with the same questions. Continue this for as long as you wish.  Information about each object can be found in the sheets provided in the box or downloaded from the ARCH website. However, a summary of each object has been included in the box for ease.  At the end of the activity collate the class’s ideas and give them the current established archaeological information about each object based on the summary provided. | | |

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| **Main** | | | | **35 minutes** |
| **Axes** (10 minutes) | Resources: British Isles map, Google maps | | | |
| * This is an exercise designed to encourage students to begin considering where people in the past would have sourced their materials. * The task involves a brief look at maps, but this section could be incorporated into a much bigger geography based lesson. | | | | |
| Show the students the different axes in the box and pass them around. Ask the class ***Which do you think would be better for chopping wood?***Discuss in a *think-pair-share* exercise and have the students explain ***why***they came to that conclusion.  Experience shows that some students may believe the stone axe is better because it looks smoother and more uniform while others will think the flint axe because of how sharp the flint appears to be. In reality both are effective.  Explain that in the historical era these axes originate from, there was no money. If you wanted something you had to trade for it or make it yourself. The only problem was, there is very little naturally occurring flint in Scotland.  Using maps locate the following:  **Perthshire** – some axes have been found made from stone quarries near Killin in Perthshire.  **Cumbria** – some axes have been found made from stone sourced near Great Langdale in Cumbria.  **Northern Ireland** – again axes have been found in Scotland made from stone from Co. Antrim in Northern Ireland.  **Yorkshire** – Flint axes have been found from flint sourced here.  Ask the students **G*iven that they had no cars in prehistoric times, how would people travel?***(Walking or sailing). On the board, or if the students have access to individual ICT, display google maps. Using the directions section find out the distance from the school to the flint source (Yorkshire).  Using the DST triangle, the mileage calculated with google and an assumed walking pace of two miles per hour ask the students to calculate the time it would take to travel from their school to the destination. They should consider how far individuals could travel in a day, the need to set up camps, source food etc. to calculate a realistic journey time based on these factors. Collate their ideas and explanations of how long it would have taken.  Explain to the students that it is very unlikely someone would travel that far for flint. Ask ***Why might this be?*** And follow up with the question ***How then would trade take place?***  Instead they would trade with their neighbours, who would trade with another group close by and through that process the flint would travel across the country, or greater trade was established through the use of boats to transport goods (this may be an opportunity if interest and time allows to research evidence of prehistoric boats).  Finally explain that the flint axes were often blanked at the quarry. Instead of just transporting a lump of rock, someone would knap the flint into a rough axe shape and trade those instead. Presumably they were ‘worth more in trade value’ as they saved people time and were also much easier to transport whether on foot or by boat. | | | | |
| **Carved Stone Ball** (10 minutes) | | | Object: Carved stone ball (Box 1) Information Sheets: Carved stone ball object sheet | |
| * This is a fascinating object and one that really allows the class to be creative when exploring what it may have been used for. | | | | |
| Show the carved stone ball to the class. Take care to show them the decoration and the definite geometric shapes that have been carved into it. If you have the time, allow them to feel the weight of the object.  As a *think-pair-share* exercise ask the class ***What is it?* W*hat is it used for?*** And ***Why do you think this?***  Join two pairs to form a small group. Have each pair share their ideas and the reason they came to that conclusion. Collate these ideas on the board.  Hand out the information sheet on carved stone balls. Have them read the information and ask ***What do archaeologists say they were used for?***  The real answer is… we are not really sure. It is almost definitely not a weapon as carved stone balls tend to be undamaged when they are found on archaeological sites. Maybe one of the classes’ suggestions is correct.  *OPTIONAL: Have the class conduct some research, in pairs, with the following questions:* ***What are the different theories surrounding the use of carved stone balls? Which do you feel is the most feasible and why?*** *Have the pairs share their findings with the rest of the class.* | | | | |
| **Knapping** (15 minutes) | | Resources:  Objects: Scraper, Microlith, Flint blades, Barbed and tanged arrowheads (Box 1)  Information Sheets: CT Flint Knapping, Additional image of Polished Neolithic Stone Axes  Other Resources: ARCH Flint Knapping Workshop video ([link](http://www.archhighland.org.uk/experimental-archaeology.asp)) | | |
| * This part of the lesson involves watching a video demonstration of flint knapping in process. * Time stamps are included below to allow you to pause the video for further discussion. | | | | |
| Gather the class round and show them the scraper. This object, while small, is one of the most interesting in the box. It is a useful object for a prehistoric person. However, it is the wave shape on the underside that is fascinating as this is known as the bulb of percussion. This is where the flintknapper has struck the flint and caused a bulge in the shape of the flake. The ripples are the force traveling through the rock and forcing the flake to break from the larger piece.  Show the class the ARCH video of flint knapping in process. This video was filmed during an ARCH workshop and shows the process of knapping a large piece of flint to create one of the axeheads contained within the box.  Pause the video at **2:53**. Explain to the class that the demonstrator is carefully choosing where he strikes the flint as he is able to control how much he is taking off each time.  Show the class the microlith, scraper and the flint blades. When making an axehead from a large piece of flint there is a lot of excess material which can then be used to make smaller useful objects. Hand the smaller objects around (**some of the flint objects, particularly the blades, are extremely sharp and need to be handled with extreme care**).  Before starting the video again, ask the students to focus particularly on the importance of choosing the correct place to strike the flint and how this can affect the shape. Stop again at **5:08.** Show the class the flint knives to highlight the demonstrator’s point that the knives come off already sharp, hence their rough shape, and don’t need any further work to be useable.  Send around the flint arrowhead, and explain that some of the material that is being taken off was then shaped into objects such as arrowheads. Remind the students that in the making of one axehead people could also make a huge range of other tools.  Stop at **9:31**. In that last section it shows just how much skill and knowledge is involved in flint knapping. Not only was he able to spot where “problem areas” were which would prevent the axe working effectively, but he had to work around the features of the flint to be able to “set up” a way of solving the problem.  Finally ask the class ***How long did that axehead take to make?*** One hour, but it would take another sixty hours to polish the axe to a smooth almost glassy appearance (which is how we find most flint axes). This would be achieved using a rough stone and water for hours at a time. There are pictures of polished flint axeheads included in the box. These are worth referencing with the class as they look very different to the items contained within the box and show the end product after sixty hours of polishing. | | | | |

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| **Plenary** | | **5 minutes** |
| **Interesting Object** (5 minutes) | Resources: Stone objects from Box 1 | |
| * While the lesson plans are written in a specific order, they do not need to be followed to the letter. * Finding out which objects students find most interesting can be used to help choose which lessons to deliver. | | |
| Display the stone objects clearly. Students identify which is, for them, the most interestingobject and why? Collate the answers as a class.  Finally, ask the students ***Which is the most useful object and why?***Collate the answers as a class. | | |
| **Total Lesson Time: 55 minutes** | | |
| **Links and Further Information** | | |
| ARCH Experimental Archaeology Project: <http://www.archhighland.org.uk/experimental-archaeology.asp>. The flintknapping section has links to a video showing knapping taking place, and to a blog which has various other videos, photos and other on-line references.  The Scottish Archaeological Research Framework (ScARF) panel reports in the Mesolithic, Neolithic and Bronze Age sections detail the current summary of state of knowledge (www.scottishheritagehub.com):  [Mesolithic artefacts](http://www.scottishheritagehub.com/content/411-artefacts)  [Neolithic Small knapped tools](http://www.scottishheritagehub.com/content/521-small-knapped-tools-such-scrapers-and-blades)  [Neolithic Axeheads](http://www.scottishheritagehub.com/content/522-axeheads-plus-adze-heads-and-chisels)  [Coarse Stone artefacts from the Neolithic](http://www.scottishheritagehub.com/content/523-coarse-stone-artefacts-neolithic)  [Neolithic Special Stone Arefacts](http://www.scottishheritagehub.com/content/524-%E2%80%98special%E2%80%99-stone-artefacts-eg-carved-stone-balls-and-maceheads) [Flaked lithics of the Bronze Age](http://www.scottishheritagehub.com/content/432-flaked-lithics-bronze-age)  [Bronze Age Coarse Stone Artefacts](http://www.scottishheritagehub.com/content/431-coarse-stone-artefacts)  Wickham-Jones, C.R. and Collins, G. 1977-8. ‘The sources of flint and chert in northern Britain,’ *Proceedings of the Society of Antiquaries of Scotland* v. 109, pp. 7-21. This is available online at archaeologydataservice.ac.uk/archives/view/psas/volumes.cfm  **Images**  There is no one publication which features flint and other lithic tools from the Highlands. SCRAN ([www.scran.ac.uk](http://www.scran.ac.uk)) has a number of pictures of flint artefacts from all over Scotland (free access is possible for schools and many Scottish library accounts). For the Highlands these include:   * [Neolithic arrowhead from Little Ferry,Sutherland](http://www.scran.ac.uk/database/record.php?usi=000-100-033-805-C&scache=2ybtk32oc7&searchdb=scran) * [Bronze Age barbed and tanged arrowheads from burial at Culduthel, Inverness](http://www.scran.ac.uk/database/record.php?usi=000-000-136-604-C&scache=1ybs832oc6&searchdb=scran)   Highland Community Timelines: an exploration of the heritage of eight Highland communities by Susan Kruse (published by ARCH) illustrates a number of stone objects from the Highlands. This is available in the Highland library system. Other Videos: Making a stone axehead by James Dilley (3:45) <https://www.youtube.com/watch?v=VDJ5gJxheRo>  How to make a prehistoric flint axe by James Dilley (3:18) <https://www.youtube.com/watch?v=ryMJ3c1gHuw&t=97s>  Brandon Flint Knappers producing gunflints (4:34) <https://www.youtube.com/watch?v=7XPEoiY3NnI> Archive film from the 1940s talking about making gun flints  **Other websites:**  [James Dilley’s website](http://www.ancientcraft.co.uk) [www.ancientcraft.co.uk/](http://www.ancientcraft.co.uk/) has a number of resources relating to flint knapping. | | |

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