The beginning and spread of iron working and farming

Lesson plan and teacher's notes · Form 1 History · 1 period of 40 minutes

School	(write school name)	**Teacher**	(write name)
Date	(date)	**Class**	Form 1
Subject	History	**Enrolment**	Boys ___ Girls ___ Total ___
Time	40 minutes	**Topic**	The beginning and spread of iron working and farming

Learners explain how iron was made and shaped, how iron working and farming spread into Zambia, and how iron tools changed farming and community life. The lesson compares stone and iron tools using the hoe and the axe that learners know from the field.

Specific outcomes

By the end of the lesson, learners should be able to:

1. Explain what smelting and forging are and the steps from ore to tool
2. Describe how iron working and farming spread by migration and by learning from neighbours
3. Compare stone tools and iron tools
4. Analyse how iron technology changed farming, surplus and settlement

Prior knowledge

- Hunting and gathering as the earliest way of life
- The names of common farm tools such as the hoe and axe
- The meaning of a community and of trade

Teaching and learning materials

- chalk and board
- an iron hoe or axe from home or school
- a stone from the school ground to hold beside the iron tool
- exercise books

References

Ministry of Education (CDC) Form 1 History syllabus and module; 25Schools learners' note: The beginning and spread of iron working and farming.

Lesson development

Stage and time	Teacher activities	Learner activities
Introduction 5 min	Hold up an iron hoe and a stone. Ask which would clear a field faster and why. Take three answers and write iron technology on the board.	Handle or look at the tool and the stone and give a reason for their choice.
Development: making iron 12 min	Build the key words: iron ore, charcoal, smelting, forge, smith, bellows, surplus. Draw the order on the board: dig ore and make charcoal, smelt, forge, cool and sharpen.	Copy the order and say in one sentence why charcoal comes before smelting.
Development: spread and comparison 10 min	Explain migration and learning from neighbours and trade. Place iron working in Zambia within the first thousand years AD. Fill the stone and iron table.	Complete the table and give one way the knowledge reached a village that had no smith.
Development: impact 8 min	Take the four effects: faster clearing, better digging, surplus and trade, larger settled communities. Link each to the next.	Put the four effects in order on a chain of arrows.
Conclusion 5 min	Ask two learners to explain, in their own words, how a surplus changed a family's life. Set the homework.	Answer and copy the homework.

Teacher's content notes

Read these before the lesson. They are what you need to know, not what to copy onto the board.

Before iron

Early people hunted and gathered. Later they learnt to plant crops and keep animals, using tools of stone, wood and bone. Stone tools were heavy and could break, so farmers could farm only small pieces of land, and a family often had to leave when the soil lost its goodness.

Making iron

First the smith dug the ore and made charcoal, because charcoal gives a hotter fire than wood. He smelted the ore with charcoal in a clay furnace using bellows. He then forged the iron by heating it until soft and hammering it into a hoe, axe, knife, spear or arrowhead, then cooled and sharpened it.

How it spread

Iron working did not appear everywhere at once. Farming communities that knew iron working migrated and brought crops, tools and skills with them. Neighbours learnt from one another or traded for iron tools. Iron working reached Zambia within the first thousand years AD.

Stone and iron tools

Iron tools were harder and stronger than stone tools. An iron edge could be sharpened again and again, so one tool lasted much longer. The table sets out what this meant for the farmer's work.

Impact on farming

Farmers cleared land faster and dug and weeded better, so fields grew bigger and gave more food. A surplus could be stored, used to feed more children or traded. More food meant a larger population, and farmers could stay on good land for many years.

Questions to ask during the lesson

Question	Expected answer
A boy watches a smith burn wood slowly in a covered heap, then put ore and the burnt wood into a furnace where bellows push air into the fire. (a) Name the burnt wood. (b) Say what the bellows do. (c) Say what happens to the iron in the ore.	(a) Charcoal. (b) Push air into the fire so it gets very hot. (c) It separates from the rock.
A learner is told that after the smith smelts the iron he heats it again until soft and hammers it on a stone into a hoe. (a) Name this process. (b) Say how it differs from smelting. (c) Name one other tool the smith could make.	(a) Forging. (b) Smelting takes iron out of the ore; forging shapes the iron. (c) An axe, knife, spear or arrowhead.
A grandmother says her village had no smiths until farmers from another area arrived with iron tools and shared their skills. (a) Name the movement of these farmers. (b) Name one other way the skill could have spread. (c) Say what the farmers brought with them.	(a) Migration. (b) Learning from or trading with neighbours. (c) Their crops, tools and skills.
A farmer with a stone axe takes three days to cut one large tree, while a neighbour with an iron axe takes a morning. (a) Name the main reason. (b) Say what the neighbour can do with the saved time. (c) Say what this does to the size of fields.	(a) Iron is harder and stronger and holds a sharp edge. (b) Clear more land or dig and weed. (c) Fields become bigger.

Worked examples for the board

Example 1: from ore to hoe

A smith needs a hoe. He digs iron ore and burns wood slowly in a covered pit to make charcoal. He smelts the ore with charcoal in a clay furnace using bellows, then forges the iron into a hoe, cools it in water and sharpens it on a stone.

Example 2: a chain of effects

A village gets iron axes. Farmers clear land faster, so fields grow bigger and give a surplus. The surplus is stored and traded, more people can live together, and the village stays on good land for many years.

Example 3: comparing tools

A stone axe is heavy and may break, and it is slow to use. An iron axe is stronger and can be sharpened again and again. So a farmer with an iron axe clears more land in the same time.

Board plan

Write the title and iron technology. Left: key words. Centre: the order of iron making from ore to sharpened tool. Right: the stone and iron comparison table. Bottom: the chain of effects of iron tools on farming.

Feature	Stone tools	Iron tools
Strength	Heavy and could break	Harder and stronger
Sharpness	Hard to keep sharp	Sharpened again and again
Effect on work	Small fields only	Larger fields cleared

Stone tools compared with iron tools

Mistakes to expect

Learners often think	Put it right
Iron working appeared everywhere at once.	It spread slowly as farming communities moved and as neighbours learnt from or traded with one another.
Smelting and forging are the same.	Smelting takes the iron out of the ore. Forging heats the iron until soft and hammers it into a tool.
Iron tools only changed the tools and nothing else.	They led to a surplus, trade, a growing population and settlements that stayed on good land for many years.

Differentiation

Learners who struggle

Give learners a strip with the five steps from ore to tool in the wrong order and ask them to arrange the strip before they write the steps.

Learners who finish early

Ask learners who finish early to explain how a village without a smith could still end up with iron tools, using trade and learning from neighbours.

Hearing or visual impairment

For learners with hearing impairment, write each key word and each step on the board and face the class. For learners with visual impairment, let them feel the stone and the iron tool and describe the difference aloud, and read the steps slowly.

No projector, no printing

If no iron tool is available, draw the hoe and axe on the board. A stone from the ground gives the comparison, and all steps are drawn as a chain on the board.

If time is short

Teach the order from ore to tool and the chain of effects of iron tools on farming. Set the spread of iron working and the stone and iron table as homework reading.

Evaluation

Question or task	A correct answer shows
A smith in a village digs ore and burns wood slowly in a covered pit before putting the ore into a clay furnace and pumping air into the fire. (a) Name what he is making in the pit. (b) Say why he needs it. (c) Name the process in the furnace.	(a) Charcoal. (b) It gives a much hotter fire than ordinary wood. (c) Smelting.
A farmer with a stone hoe watches her neighbour clear a large patch of woodland in a week with an iron axe and then grow a bigger crop. (a) Give two reasons iron tools were better than stone tools. (b) Say how the axe helped the neighbour. (c) Say what the extra food is called.	(a) Stronger and did not break easily, could be sharpened again and again. (b) It cut trees and cleared bush faster so more land could be farmed. (c) A surplus.
A village that has no smith begins to use iron hoes after traders and a group of farmers from another area settle nearby. (a) Name the two ways the knowledge spread. (b) Say what the movement of the farmers is called. (c) Say why the village can now stay longer on its land.	(a) Migration of farming communities and learning from or trading with neighbours. (b) Migration. (c) Bigger fields and better digging mean the soil lasts and farmers need not move on.

Homework

A family has a surplus of maize after using iron hoes and sells some to a neighbouring community for an iron axe. (a) Name two things the surplus lets the family do. (b) Say how trade changed contact between communities. (c) Say how the surplus could lead to a larger population.

Extra practice with answers

Question	Answer
1. A man in a village makes a hoe and says the work of the smith has three jobs before the hoe is ready. (a) Name two jobs before smelting. (b) Name the job after smelting. (c) Name the last two things done to the hoe.	(a) Digging the ore and making charcoal. (b) Forging. (c) Cooling in water and sharpening.
2. A family farms with stone tools and must move every few years because the small field no longer feeds them. (a) Give one reason the field is small. (b) Give one reason they move. (c) Say what iron tools could change.	(a) Stone tools are heavy and slow. (b) The soil loses its goodness. (c) Bigger fields and better digging let them stay on good land.

3. A trader brings iron hoes to a village that has no smith and exchanges them for dried fish and maize. (a) Name the way the village obtains iron. (b) Say what this does to contact between communities. (c) Name one effect on the farmers' work.	(a) Trade. (b) It brings communities into contact. (c) Farmers dig and weed better.
4. A teacher says historians place the arrival of iron working in Zambia in the first thousand years AD. (a) Say what AD means. (b) Say whether the exact date is known. (c) Name who brought iron working to Zambia.	(a) Years counted after the birth of Christ. (b) No, historians give a range. (c) Farming communities who moved into the region.
5. A chief notices that since his people began using iron axes, they store grain for the dry season and the village has grown. (a) Name the extra food. (b) Give one use of it. (c) Say why the village has grown.	(a) Surplus. (b) Store for the dry season, feed more children or trade. (c) More food means more people can live together.
6. A pupil argues that a stone hoe is as good as an iron hoe because both dig soil. (a) Give one way iron is better. (b) Say what an iron edge can do that stone cannot. (c) Say how this affects the farmer's field.	(a) It is stronger and breaks less. (b) Be sharpened again and again. (c) The farmer can work a bigger field.

Answers to the learners' check-yourself questions

1. What is smelting?
   Heating iron ore with charcoal in a very hot furnace so that the iron separates from the rock.
2. What is the difference between smelting and forging?
   Smelting takes the iron out of the ore. Forging heats the iron until soft and hammers it into the shape of a tool.
3. Why did a smith make charcoal before smelting?
   Charcoal gives a much hotter fire than ordinary wood, and smelting needs very great heat.
4. Name two ways in which iron working and farming spread across Africa.
   Farming communities with iron working moved and settled in new areas (migration), and communities learnt from or traded with one another.
5. Give two reasons why iron tools were better than stone tools.
   They were stronger and did not break easily, and they could be sharpened again and again.
6. How did an iron axe help a farmer?
   It cut down trees and cleared bush faster, so more land could be opened for fields.
7. What is a surplus, and why was it important?
   A surplus is more food than a family needs. It could be stored for the dry season, used to feed more people and traded.
8. Why did early farmers with stone tools often have to move from place to place?
   Their fields were small and the soil lost its goodness, so they had to leave and clear a new patch elsewhere.

Teacher's reflection

What went well:

What I will change next time:

Learners who need follow-up: