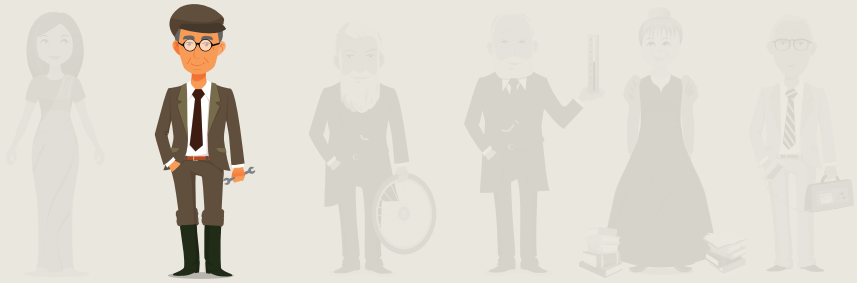
Lesson Activities
Harry Ferguson



Lesson Activities

This lesson will look at innovation, understanding problems and coming up with potential solutions to those problems. There is a focus on using Thinking Skills and Personal Capabilities throughout the lesson. Children will be working in groups; they will need to problem-solve and be creative. Therefore it may be useful to distribute some of the cards from CCEA's Think Pack to help children work through these tasks. Throughout the lesson, specific resources from the Think Pack are referenced.

The 3-Point Linkage System

Distribute Resource 1 (The 3-Point Linkage System and Harry Ferguson) to children and ask them to read it. There are also lots of videos online that will help children understand the importance of Ferguson's invention; the two below are particularly useful:

- Ferguson T20 History and Archive
- Ferguson System 3 Point Linkage

Ask children to sit in pairs and discuss the following questions:

- What was innovative about Harry Ferguson's design?
- What problem did his design solve?
- How did it solve the problem?
- Why was the invention of the 3-point linkage system so important?

Ask for feedback from the class.

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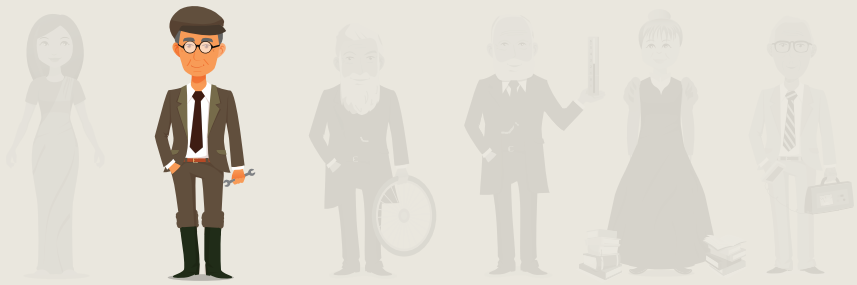

Problems in Transport Today

Explain to the children that they are going to be like Harry Ferguson and show how innovative they are. They are going to think of a particular problem with a form of transport; it can be a bicycle, car, bus, tractor, train or whatever they like. They are then going to analyse what causes the problem. Finally, they are going to come up with ideas on how to change the form of transport to solve that problem.

Divide the class into groups and ask the groups to think about and discuss problems with forms of transport. It might be a good idea to use prompts to help them think of particular problems, for example:

- How can safety be improved in cars or bicycles?
- How can they make it easier for drivers in lorries to see cyclists that are beside them?
- How can cars use less petrol?
- How can buses be made more comfortable for passengers?

Give the children 10 minutes to discuss and then ask them to decide on the three most important problems to solve as a group. Students could use the 'Card Ranking' or 'Diamond Ranking' activities to help them rank their ideas. These activities are detailed in CCEA's Active Learning and Teaching Methods for Key Stages 1 & 2.

Ask the groups to nominate someone to feed back to the class with their top three problems.

Analysing the Problem

Remind the children that one of the reasons that Harry Ferguson was able to solve the problem with how ploughs connected to tractors, was that he thought very hard about all the factors that contributed to the problem.

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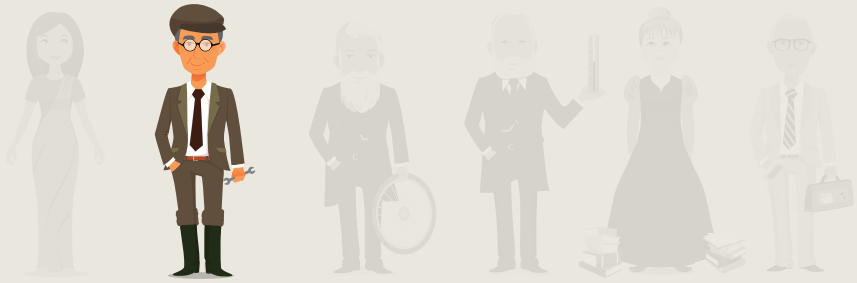

Ask the groups to take the three problems that they decided were most important. Distribute a number of copies of the 'Thinking it Through' Thinking Card which is part of CCEA's Think Pack resource. Alternatively this card can be shown on an interactive whiteboard and discussed as a whole class. This resource asks children to use a series of how and why questions to really examine the problem that they are considering. Ask the children to make a note of the answers to the how and why questions for each problem.

Solving the Problem

Explain to the groups that they're now going to get creative. Ask them to come up with ideas on how they could make an adjustment to a mode of transport that could solve the problems that they've noted. It's OK if their proposed solutions only solve one part of the problem that they have discussed.

Give them 5–10 minutes to brainstorm ideas. Explain that during this time they should allow everyone in the group to share their ideas; they don't need to judge how good the ideas are.

After brainstorming, ask the children to decide as a group on three or four ideas they like the best. Then, using the 'Which idea will work best?' card from CCEA's Think Pack, they should agree the good points and bad points of each idea.

Give them 10 minutes to do this and to decide on which of the proposed solutions is the best.

Presenting their Solution

Ask the children to create a presentation that will show their innovative solution to the rest of the class. This part of the activity could be completed on paper, or you could ask children to create a PowerPoint presentation.

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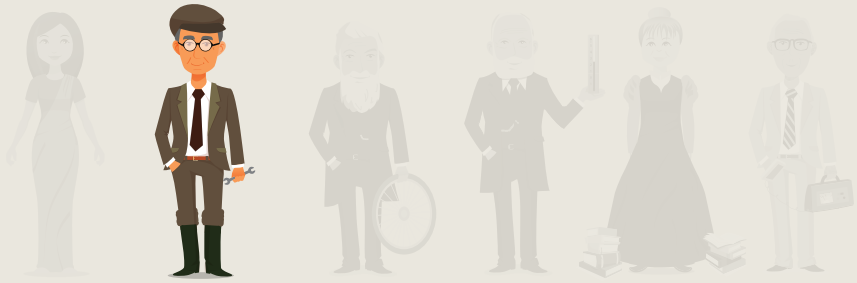

The presentation should contain the following information:

- Details about the problem that they are trying to solve.
- Why it's important to try to solve the problem.
- A description of how they suggest the mode of transport should be adjusted (including diagrams and pictures).
- An explanation of how the adjustment solves the problem.

Ask the children to nominate roles within their group so that they can complete the task successfully. They will need one presenter in the group.

Children could complete the task within an hour or you may wish to extend the project over a number of sessions.

When the presentations are prepared, ask each group's presenter to show their proposed solution to the rest of the class.

Reflection

Ask children to reflect on their learning throughout the lesson. Did they find out anything new about Ulster-Scots or innovation? Encourage them to add to the KWL grid that they started in the 'Let's Plan' lesson.

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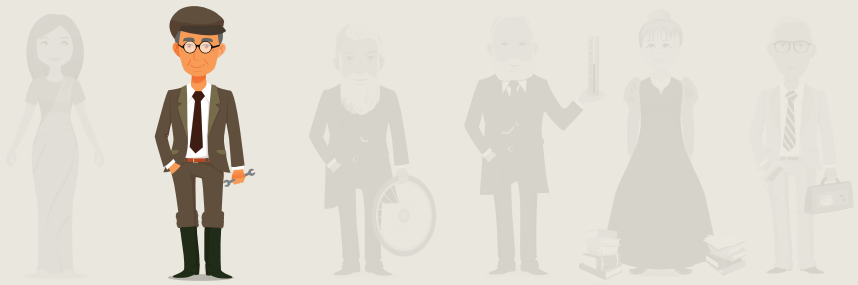

What's Next?

- Visit the Ulster Folk and Transport Museum to see the Ferguson tractor
- Tractors
  - Farming Thematic Unit (CCEA)
  - Visit a local farm or interview a local farmer to find out more about how tractors are used on the farm.
  - Mass production
    - Find out more about Henry Ford's assembly line production
      - How are cars and tractors made today?
- Harry Ferguson
- 3-Point Linkage System
- What does hydraulic mean?
  - Hydraulics and pneumatics
    - Link to John Boyd Dunlop lesson
- What other things use hydraulics?