

**Design and technology
Materials
Research 3 types of bridges.**



1) Students collect small whiteboards/whiteboard markers (1 between 2) – Student with the shortest hair in the partnership collects the whiteboard.

2) After collection of whiteboards students watch the youtube video <https://www.youtube.com/watch?v=KBOGRxV49MQ>



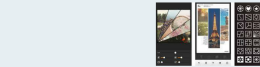
3) While watching the youtube clip, students are looking for similarities and differences in the designs of each of the three kinds of bridges (truss, suspension and arch bridges)

4) On whiteboards students write in pairs the bridges that were mentioned in the clip and write 4 things down on the whiteboard that they noticed about how the design promoted strength and durability. This is then shared to the class and written on the blackboard as a brainstorm

5) Student with the shortest hair in the partnership returns the whiteboard and collects an iPad for each person. Students use the iPads to research the three types of bridges further

6) Using Pic Collage on the iPads students create a poster detailing the material and design aspects of each aspect (minimum of 3 per bridge type).

7) Once the pic collage has been created students have the poster checked by the teacher before the student can print it for collection



This is an example of pic collage being used to create a poster on buildings. Pic collage is a free app for the iPad that allows students to find pictures on the internet and add text. This is great from middle to upper primary. However can be complicated for lower primary students

Some good websites for the students to use include:
<http://www.sciencekids.co.nz/sciencefacts/engineering/bridges.html>
<http://www.imcpl.org/kids/blog/?p=10734> - how bridges work
<http://easyscienceforkids.com/all-about-bridges/>

Using Pic collage relates to the outcomes Generate, develop, and communicate design ideas and decisions using appropriate technical terms and graphical representation techniques (ACTDEP015): sharing and documenting using digital tools.
 Also Critique needs or opportunities for designing and explore and test a variety of materials, components, tools and equipment and the techniques needed to produce designed solutions (ACTDEP014)
 - examining the structure and production of everyday products, services and environments to enhance their own design ideas

ABOUT THIS LESSON

This lesson is suitable for most middle to upper primary students. It is interactive and involves a variety of resources to engage the learner. It has a good mix of partner and individual work as well as incorporating speaking and listening and viewing skills. By the end of the lesson students are able to identify and explain three features of the three types of bridges - truss, suspension and arch. This lesson is easily modified by either decreasing or increasing the amount and/or nature of information required to be found by the students. Students that have learning difficulties may only be required to find information on one or two types of bridges.
 By the end of the five lesson sequence students design, construct, test and evaluate a bridge based on research and information collected over the first three lessons.

Key questions in this lesson include:
 What are three common types of bridges?
 What materials are used in bridge construction?
 Where/Why bridges are used?
 What features of the bridges help to maintain strength and stability?



8) To conclude students are then able to 'mirror' their poster on the interactive whiteboard and present it to the class. They need to explain what they found out about each of the three bridges.

Information on how to mirror can be found at <http://support.apple.com/kb/HT5209>

Mirroring is when the student connects their iPad to the whiteboard wirelessly and the image on the iPad is shown on the big screen.

This links across to digital technologies as well as speaking and listening.

This is in line with the design and technology materials curriculum:
 Generate, develop, and communicate design ideas and decisions using appropriate technical terms and graphical representation techniques (ACTDEP015) -
 •visualising and exploring innovative design ideas by producing thumbnail drawings, models and labelled drawings to explain features and modifications
 -planning, sharing and documenting creative ideas and processes using digital tools such as a class blog or collaborative document

This is a direct link to the Australian curriculum: Investigate how forces and the properties of materials affect the behaviour of a product or system (ACTDEK011) -
 •identifying and exploring properties and construction relationships of an engineered product or system, for example a structure that floats; a bridge to carry a load)