ALL ABOARD PROGRAM

UNDER CONSTRUCTION

LEVEL

The Early Years, Level A-D (towards foundation), Foundation – Level 2

ACTIVITY DESCRIPTION

It has been raining heavily in the Dandenong Ranges and the creek is overflowing. Puffing Billy needs your help! Working in a small group, design and build a bridge that spans a gap of 50cm and supports the weight of a toy car, so Puffing Billy can safely get its passengers across the creek, without getting wet! The task has been developed to broaden the students understanding of materials, design and construction for everyday purposes.

THEME

- Construction
- Design and Technology
- Materials

MATERIALS REQUIRED

- Rubber bands
- Foil
- Masking tape
- Newspaper
- Icy-pole sticks
- Glue
- Cardboard
- Plastic cups
- “Plan and Create” worksheet
- “Reflect and Share” worksheet

INSTRUCTIONS

Discuss the scenario as a whole group. Ask the students how they would go about solving the problem. Show the students the different types of materials you could use. Demonstrate the strength and composition of different materials. Use icy-pole sticks, plastic, foil, rubber bands and glue to show how different materials work. Working in a small group, design and build a bridge that spans a gap of 50cm (between two tables) and supports the weight of a toy car.

Students then undertake three different stages of the project. Plan, Construct, Reflect.

Hand out the “Plan and Create” worksheets to each student.

1. PLAN AND CREATE

Which materials are you going to use?

Why did you choose these materials?

Draw a diagram of your bridge.

Make sure each student has successfully completed their planning worksheet before they move onto the construction stage.

2. CONSTRUCT

Using the materials provided students construct a bridge.

3. REFLECT AND SHARE WORKSHEET

Did you help Puffing Billy?

What would you change in your design and why?

Compare you design to others, how it is it different, how is it the same?

SUGGESTIONS FOR ASSESSMENT

Completion of the construct of a bridge using carefully selected materials.

Successful completion of the “Plan and Create” and “Reflect and Share” worksheets.

BACKGROUND INFORMATION

PUFFING BILLY RAILWAY – HORSESHOE BRIDGE

For a long time the Horseshoe Bridge was the region’s most famous bridge, on its most famous railway line. Probably the most photographed structure in the region. “Built 1899 for narrow gauge railway line on standard Victorian Railways pattern but unusual in its curve; known just as the ‘Horseshoe Bridge’”(National Trust Citation).

The Rail Bridge, over Monbulk Creek is historically and socially important for its association with the recreational tourism industry in Victoria. The journey into the hills, including the ride over this famous bridge, became a popular weekend recreational activity enjoyed by local and overseas visitors from the lines’ initial construction in 1899, and after its re-opening as the Puffing Billy Line in 1965. The Rail Bridge, over Monbulk Creek is architecturally important because it is an essentially intact example of a timber trestle bridge and is possibly the most extremely curved surviving bridge in Victoria.

Constructed c.1899 by Board of Land and Works Railway Construction Branch. Cost - 482 pounds. No extensions and progressive replacement of timbers dated. (Tansley, 1978) The bridge is a timber girder bridge with fourteen spans of 6m. It is of considerable height, with piers to 11m high, it is built to a tight radius of 60m, giving rise to its name, The Horseshoe Bridge. It is a good example of light gauge timber construction in difficult terrain. (RNE, 016043)

REFERERENCES

Yarra Rangers Council – Yarra Rangers Heritage Database

http://vhd.heritage.vic.gov.au/yarraranges/result_details/115714

CURRICULUM LINKS

DESIGN AND TECHNOLOGIES

Explore the characteristics and properties of materials and components that are used to create designed solutions (VCDSTC017)

Visualise, generate, and communicate design ideas through describing, drawing and modelling (VCDSCD019)

Use materials, components, tools, equipment and techniques to produce designed solutions safely (VCDSCD020)

PLAN AND CREATE

Draw a diagram of your bridge. Do not forget to choose your materials carefully.

REFLECT AND SHARE

Did you help Puffing Billy?

What would you change in your design and why?

Compare you design to others, how it is it different, how is it the same?