



EPISODE 3: CHANGING THE LIGHTBULB

Jiwi's MACHINES



SEESAW SURPRISE

TO TEACHERS AND PARENTS

A large focus in teaching science is around encouraging both curiosity and the skills and dispositions to be able to find out or test things for yourself. This includes developing an understanding about how science itself works. The New Zealand Curriculum calls this the Nature of Science.

Tips about how to encourage these aspects are given in a



Use these to get your children talking, discussing, testing and thinking about the science involved in Jiwi's Machines. Have fun! The science content involved in Jiwi's Machines relates to the Physical World Achievement Aims of the New Zealand Curriculum.

<http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum/Learning-areas/Science/Achievement-objectives>

SEESAW SURPRISE

In SEESAW SURPRISE, we see that a lever will move up and down over a fulcrum depending on the balance of weight. Watch the clip again and have the children identify and explain what is happening using cause and effect.

INTERESTING NOTE: a seesaw is known in some other countries as a teeter-totter or a teeterboard.

Cause	Effect
The man and bag weigh more than the woman	She is in the air
Jiwi pushes man off the seesaw	Woman's end of seesaw goes to the ground
Jiwi pushes woman off the seesaw	The bag end of the seesaw falls to the ground

In this episode, CHANGING THE LIGHTBULB, Jiwi again uses the lever as a seesaw to great effect controlling the movement of a pool ball and causing mayhem with falling vases. By changing the weight on the seesaw, Jiwi keeps the motion going. This is because the seesaw becomes unbalanced. Two things are needed to balance a seesaw or lever: weight and distance. That is, how much weight is on each side of the fulcrum and how far each weight is from the fulcrum.



Continuing from the activities earlier in EPISODE 3: THE LEVER, now try these:

ACTIVITY 1:
THE SEESAW TASK CHALLENGE
(20 minutes)

BIG SCIENCE IDEA: A lever with different weights at each end can balance by shifting the fulcrum.

Similar to the activity in THE LEVER, make your own seesaw using a paper towel roll cut in half, some tape, weights (coins, washers) and a ruler. Put a weight at each end of the ruler and adjust the ruler until it balances parallel to the table top.

To achieve the following tasks, it is alright to shift the lever backwards and forwards and to touch it to the table. The weights do not need to be stacked on top of each other.



The goal of each task is to have the seesaw balanced and parallel to the table before moving on to the next.

TASK 1: Balance three weights on each end of the lever.

TASK 2: Balance three weights on one side of the lever and six weights on the other.

TASK 3: Change the lever position so that one end sticks out twice as far from the fulcrum as the other end. Add weights until they are balanced.

TASK 4: Balance weights on one end and no weights on the other end.

Discuss what you have found and how you went about these challenge tasks.

COMMUNICATE IN SCIENCE

As these activities bring together several experiences with simple machines it could be valuable to encourage children to:

- Build and use scientific language and vocabulary
- Being honest when communicating
- Make predictions are based upon their existing science knowledge
- Sharing explanations of experiences and observations
- Realising science explanations must withstand peer review before being accepted



JIWI WONDERS

- 💡 What have you found?
- 💡 Can you make two statements about balancing levers?
- 💡 Can a lever balance on a lever?

ACTIVITY 2:
MAKE A MULTI-LEVER SEESAW
(20 minutes)

BIG SCIENCE IDEA: A lever with different weights at each end can balance by shifting the fulcrum.

Extending the same set up used in Activity 1, you can try to make a multi-lever seesaw as shown in the diagram.

What kind of balance systems can you make using more levers and weights?
Explore.



MATERIALS

<p>Activity 1 Paper towel cardboard roll Tape Ruler Coins or washers</p>	<p>Activity 2 As for activity 1 More rulers</p>
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NZ CURRICULUM PLANNING SUMMARY

<p>Contextual Achievement Objective: PHYSICAL WORLD; Explore and investigate physical phenomena in everyday situations.</p>	<p>Nature of Science Achievement Objective: COMMUNICATE IN SCIENCE; Develop knowledge of the vocabulary and use this knowledge to communicate about their own and others' ideas.</p>
<p>Big Science Idea: A lever with different weights at each end can balance by shifting the fulcrum.</p>	<p>Big Nature of Science Idea: Scientists share explanations of experiences and observations.</p>
<p>Weblinks: http://scienceonline.tki.org.nz/Nature-of-science/What-is-the-Nature-of-Science/Teacher-suggestions-Understanding-about-science http://scienceonline.tki.org.nz/Introducing-five-science-capabilities/Use-evidence</p>	<p>Capability focus: USE EVIDENCE; In science, explanations need to be supported by evidence.</p>