EPISODE 4: **RECIPE FOR DISASTER**

JIWI'S MACHINES

DOMINOES

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

DOMINOES

In this SCIENCE CLIP Jiwi shows us how dominoes can be used to **transfer motion**. It is interesting the way that something small falling can have enough energy to knock over something larger, although as this clip demonstrates there are limits! Are there other important aspects when using dominoes to transfer motion?

INVESTIGATION:

HOW COULD YOU MAKE A LINE OF DOMINOES FALL FASTER (ALL THE SAME SIZE)? (1.5 hours)

BIG SCIENCE IDEA: Objects with greater surface area are pushed more easily by air.

Pose this question to the children and ask what ideas they have. Hopefully they will suggest that having the dominoes closer together or further apart may make it faster.

Design an investigation to test a variety of spacings between dominoes. What things do we need to keep in mind to make it a fair test?

Children will suggest things such as: using the same distance each time (eg 1.5cm), doing it in a straight line, using a ruler to get spacings accurate, having the same person time it, repeating each trial several times and averaging the results.

Create a chart to collate results in. Example:

TIMES FOR DOMINOES TO FALL					
	Trial 1	**Trial 2**	**Trial 3**	**Trial 4**	**Trial 5**
1.0 cm gaps					
2.0 cm gaps					
3.0 cm gaps					
4.0 cm gaps					

At which spacing do the dominoes fall fastest?

Can you explain your results?

What would happen if the dominoes were twice as tall?

CRITIQUING EVIDENCE

Children can be encouraged to ask and answer such questions as

How sure are you of your results?
How did you get the data?
What were the possible shortcomings of this method?
How could you check your findings?
How many times was the experiment repeated?
How were the measurements taken and recorded?
How confident are you that the measurements are accurate?
Did these results surprise you?
What were you expecting to find out?
Would these results always be true?

JIWI WONDERS

- What would happen if the dominoes were taller or shorter? Try.
- Was your thinking correct? Why? Why not?

ACTIVITY:

CREATE JIWI'S DOMINO DEMONSTRATION

(30 minutes – 1 hour)

1. Give groups 10 dominoes, 2 notebooks (held together and shut with rubber bands), empty CD or DVD cases, a middle sized book and a textbook each.

Ask them to create a domino chain reaction where they all fall down. This will involve exploration by trial and error. Watch for them applying previous knowledge and experience in this task.

Listen for discussion about what might work and why, which spacing would be appropriate and why. Watch and listen as they discuss success or failure and why.

2. As in the JIWI CLIP, have some larger items on hand as well and try as a class to create a large scale domino effect similar to Jiwi's. You could even go outside to do this, borrowing crash pads from the school gym for items to land on.

USE EVIDENCE

Students should be encouraged to ask and answer questions such as

How do you know that?
What makes you think so?
How could you check that?

MATERIALS

Investigation	**Activity**
Dominoes	Dominoes
Ruler	Notebooks
A timer	CD or DVD cases
	Books
	Other larger items

NZ CURRICULUM PLANNING SUMMARY

Contextual Achievement Objective: PHYSICAL WORLD; Explore and investigate physical phenomena in everyday situations.	**Nature of Science Achievement Objective:** INVESTIGATING IN SCIENCE; Any student investigation may involve a variety of skills
Big Science Idea: Falling objects transfer their energy.	**Big Nature of Science Idea:** A well designed investigation will give results you are confident of.
Weblinks: http://scienceonline.tki.org.nz/Nature-of-science/What-is-the-Nature-of-Science/Teacher-suggestions-Investigating-in-science/Student-investigations-may-involve-a-variety-of-skills http://scienceonline.tki.org.nz/Introducing-five-science-capabilities/Critique-evidence	**Capability focus:** CRITIQUE EVIDENCE; Were there possible shortcomings in your method? How confident are you of the meaning of your results?