

Mechanical waves 1: The physics of tsunamis

Components

NAME	DESCRIPTION	AUDIENCE	
	<i>The physics of tsunamis</i> teacher guide	This shows how the resource may be used to engage student interest in the properties of mechanical waves. It provides advice on use of the various learning assets and suggests questions for group discussion.	teachers
	<i>Tsunami physics</i> background sheet	This provides basic information for teachers on the physics of tsunamis.	teachers
	<i>Dangerous waves</i> fact sheet	This explains differences between wind-waves and tsunamis to enlighten student discussion on how these waves form, how they move and why tsunamis are so destructive.	students
	<i>Dangerous waves</i> video	This contrasts two different but dangerous waves: surfers riding giant waves, and the Boxing Day tsunami crashing ashore.	students

Purpose

To **Engage** students' interest and inquiry in waves.

Outcomes

Students:

- compare surface waves with tsunami waves
- identify what they know and need to know about waves using information from videos.

Activity summary

ACTIVITY	POSSIBLE STRATEGY
Show the video. WARNING! Preview the video sequence before it is used in the classroom as it contains images that may distress some students.	Think, Pair, Share
Pose questions (see Using the video) and discuss student responses.	whole group discussion
Distribute and use the fact sheet <i>Dangerous waves</i> to support the discussion.	KWL chart

Technical requirements

A modern browser (eg Internet Explorer 9 or later, Google Chrome, Safari 5.0+, Opera or Firefox) is required to view the video. A high quality MP4 version of the video is available by download from the SPICE website.

The teacher guide, fact sheet and background sheet require Adobe Reader (version 5 or later), which is a free download from www.adobe.com.

Using the video

Play the video *Dangerous waves* and discuss it with students to contrast two different but dangerous waves: surfers riding giant waves, and the Boxing Day tsunami crashing ashore.

Student discussion following the video may be teacher-led as a whole group discussion, or in small groups using strategies such as Think, Pair, Share. Suitable discussion questions include:

- Do waves all look the same?
- What do you know about water waves like these?
- Which waves are the most dangerous?
- Why are some waves more damaging than others?
- In what ways are all these waves similar?
- If you had to, which type of wave would you rather face?

Guiding further learning

The fact sheet provides further information for students on wind-waves and tsunamis.

A KWL strategy may be introduced after students have seen the video, then read the fact sheet. In groups, students complete the first two columns: what I know and what I want to know about waves. As students continue to learn about wave characteristics and properties through later activities they can add to their questions, and write their own answers in the column headed L (what have I learnt).

Associated SPICE resources

Mechanical waves 1: The physics of tsunamis may be used in conjunction with related SPICE resources to address the broader topic of mechanical waves.

DESCRIPTION	LEARNING PURPOSE
<i>Mechanical waves</i> This learning pathway shows how a number of SPICE resources may be combined to teach the topic of mechanical waves.	
<i>Mechanical waves 1: The physics of tsunamis</i> Video and a fact sheet compare surface waves with tsunami waves.	Engage
 The sequence overview in <i>Mechanical waves</i> contains suggested Explore activities suitable for use at this point.	Explore
<i>Mechanical waves 2: Wave properties</i> This resource includes a learning object (in which students interact with a variety of waves to explore their properties) and associated student worksheets.	Explain
<i>Mechanical waves 3: Graphing waves</i> These student worksheets describe experiments with longitudinal waves.	Elaborate
<i>Mechanical waves 4: Tsunami problems</i> These student worksheets cover a range of problems concerning the physics of tsunamis and other waves.	Elaborate
 The sequence overview in <i>Mechanical waves</i> contains suggested Explore/Explain activities suitable for use at this point.	Explore/Explain
<i>Mechanical waves 5: The physics of whale stranding</i> An interview with physicist Dr Ralph James illustrates how his research into microwaves led him to develop and test a theory to explain whale beaching.	Elaborate

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