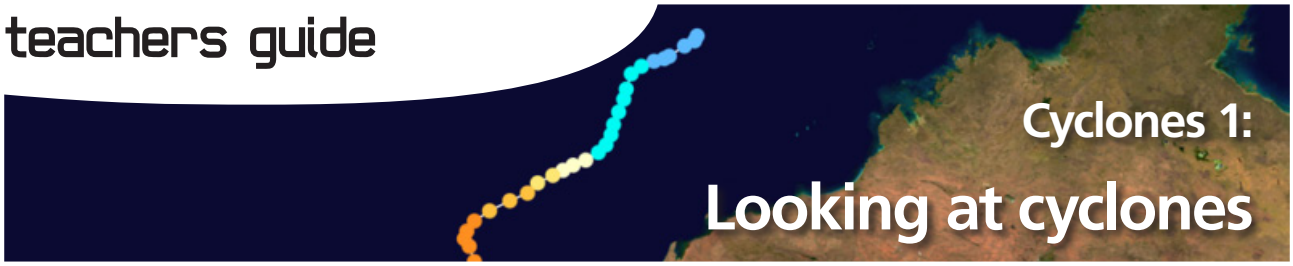
teachers guide



Cyclones 1: Looking at cyclones

Components

	NAME	DESCRIPTION	AUDIENCE
	Looking at cyclones teachers guide	This guide suggests ways to use a presentation on tropical cyclones to engage students in studying aspects of climate. Discussion questions and suggested answers are included.	teachers
	Cyclone Yasi video	Video footage of a tropical cyclone demonstrates the destructive nature of these severe weather events.	students
	Wild weather presentation	Details of tropical cyclones demonstrate the destructive nature of these severe weather events. An image showing the global distribution of tropical cyclones, hurricanes and typhoons provides a stimulus for class discussion.	students

Purpose

This resource raises awareness about tropical cyclones, and conditions that affect their formation and distribution.

Outcomes

Students:

- understand that tropical cyclones are extreme, destructive weather events that form in certain areas, under particular conditions;
- suggest reasons for distribution patterns of tropical cyclones (hurricanes and typhoons).

Activity summary

ACTIVITY	POSSIBLE STRATEGY
Show the video, *Cyclone Yasi*.	
Show the presentation, *Wild weather*.	Students discuss questions arising the video, presentation and teacher prompts.

Background notes

Tropical cyclones, hurricanes and typhoons rarely form within latitudes 10° (500 km) north and south of the Equator, principally due to diminished turning force arising from the earth's rotation. The turning force is least at the equator and increases closer to the poles. This turning force is associated with the Coriolis effect.

In the northern hemisphere, typhoons and hurricanes form in all oceans. In the southern hemisphere tropical cyclones do not form in the eastern Pacific or south Atlantic oceans. Sea surface temperatures in these oceans are not high enough to support tropical cyclone formation. The learning object, *Cyclones 2: Cyclones explorer* is an interactive simulation that allows students to explore sea surface temperatures in relation to cyclone formation in the Australian region.

The fact sheet, *Cyclones 2: How do cyclones work?*, describes factors that typically lead to cyclone formation.

Technical requirements

The teachers guide requires Adobe Reader (version 5 or later), which is a free download from www.adobe.com. The presentation requires Microsoft PowerPoint 97 or later.

QuickTime version 7 or later is required to view the video. This is a free download from www.apple.com/quicktime. A high quality MP4 version is available on CD-ROM or download from the SPICE website.

Teachers notes

Tropical cyclones, typhoons and hurricanes are all names for severe weather events that involve large masses of rotating air with a low-pressure centre. The name depends on the location. In Asia they are known as typhoons, in the Atlantic as hurricanes; and in the Indian and Pacific Oceans they are called tropical cyclones.

Although we commonly talk about 'cyclones', meteorologists prefer to use the term 'tropical cyclones' to refer to the severe weather events described here. The term cyclone refers to any weather system that rotates around a low pressure centre.

How to use the presentation

The presentation, *Wild weather*, poses two questions. The first enables students to engage with the subject by relating any personal experiences. The second question (What do 20 years of global cyclone tracks (1985–2005) show us?) raises issues for inquiry in the rest of the sequence.

Teachers may use the following prompts to raise issues through class discussion:

PROMPT	STUDENT RESPONSE
Describe the distribution of tropical cyclones, hurricanes and typhoons.	Students describe the distribution and lack of tracks in some regions of the globe
There appears to be no cyclone activity in certain areas. Why is this?	Suggestions may range from no measurements in these areas to insufficiently high temperatures, no wind and other ideas that can be addressed through activities that follow.
What towns in Western Australia would you expect to be subject to tropical cyclone activity?	Towns in northern WA are most likely to be affected but the presentation shows the widespread effects of tropical cyclone Alby.
What questions do you have about the distribution of tropical cyclones, hurricanes and typhoons?	Learning materials throughout the sequence provide opportunities to address questions raised by students.

Image credits

banner image

'Track map of cyclone Alby (1978)' by Nilfanion using data from NASA and the National Hurricane Center, PD, commons.wikimedia.org/wiki/ File:Alby_1978_track.png

presentation, *Wild weather*

- 'Cyclone Catarina from the ISS on 26 March 2004' by NASA, PD, commons.wikimedia.org/wiki/File:Cyclone_Catarina_from_the_ISS_on_March_26_2004.JPG
- 'Channel 7 news report of cyclone Yasi', used by permission
- 'Track map of cyclone Tracy (1974)' by Nilfanion using data from NASA and the National Hurricane Center, PD, commons.wikimedia.org/wiki/File:Katrina_2005_track.png
- 'Track map of cyclone Alby (1978)' by Nilfanion using data from NASA and the National Hurricane Center, PD, commons.wikimedia.org/wiki/ File:Alby_1978_track.png
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- 'Track map of hurricane Katrina (2005)' by Nilfanion using data from NASA and the National Hurricane Center, PD, commons.wikimedia.org/wiki/ File:Tracy_1974_track.png
- 'Global cyclone tracks (1985–2005)' by Nilfanion using data from NASA and the National Hurricane Center, PD, en.wikipedia.org/wiki/File:Global_tropical_cyclone_tracks-edit2.jpg

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Associated SPICE resources

Cyclones 1: Looking at cyclones may be used in conjunction with related SPICE resources to address the broader topic of how scientists use data to make predictions.

DESCRIPTION	LEARNING PURPOSE
Cyclones (overview) This learning pathway shows how a number of SPICE resources can be combined to teach the topic of cyclones. The topic is used as a context to investigate modelling of present and future climate.	
Cyclones 1: Looking at cyclones A presentation that shows effects of some recent cyclones sets the scene for a teacher-led class discussion about origins and conditions for cyclone formation.	**Engage**
Cyclones 2: Exploring tropical cyclones The resource explores patterns of cyclone formation associated with sea surface temperature and latitude.	**Explore**
Cyclones 3: Predicting tropical cyclones Data on sea surface temperatures are analysed to predict future cyclone activity.	**Explain**
Cyclones 4: Modelling climate Students investigate how the world may change if various climate change scenarios, suggested by CSIRO research, are followed.	**Elaborate**