

Introduction to Climate Prediction

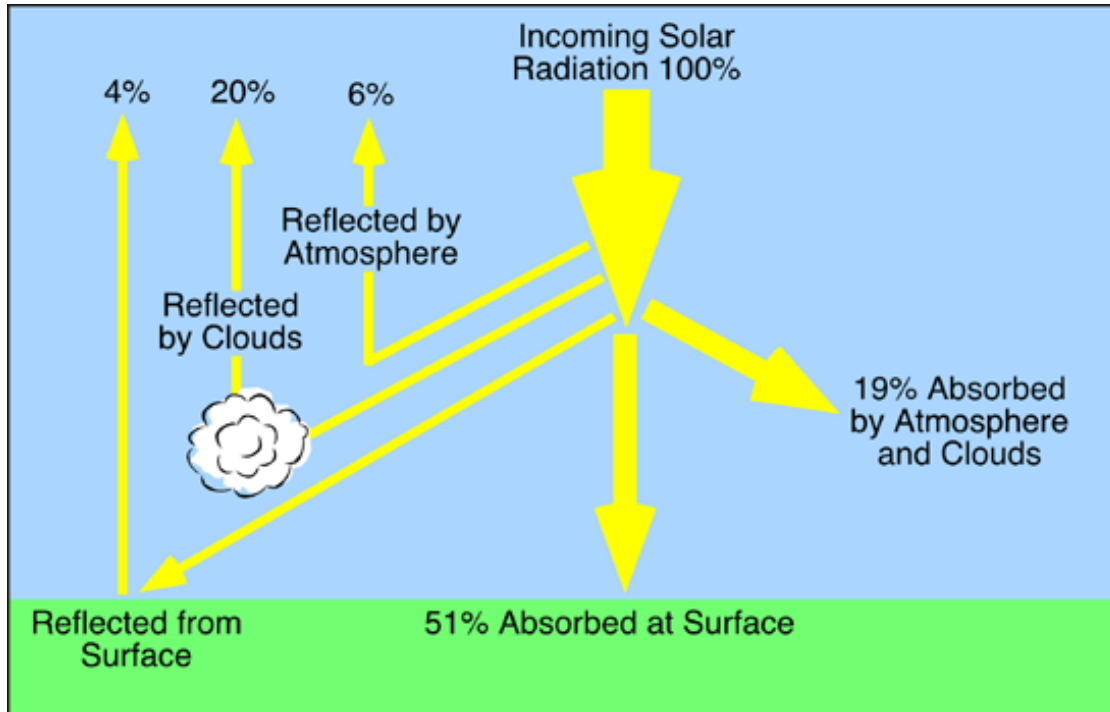
Find out what happens to radiation from the Sun when it gets to the Earth, and what this means for the planet's temperature.

The Earth from Space



- Think about looking at the Earth from Space. What do you see?
- What forms of radiation reach the Earth from the Sun?
- What happens to this radiation? Where does it all end up?

What happens to Solar radiation



- Most of the radiation from the Sun is absorbed.
- The Earth warms up.

Diagram from physicalgeography.net

The Greenhouse Effect



- The Earth is warm, so it too gives off radiation.
- The radiation absorbed by the atmosphere in turn warms up the Earth, keeping it at a comfortable temperature.
- Without the atmosphere, the temperature on the Earth would be 33°C cooler than it is now, as cold as the inside of a freezer!

Predicting the climate



- Why do you think it is important to understand the factors that affect the temperature of the Earth?
- Who does it affect and why?

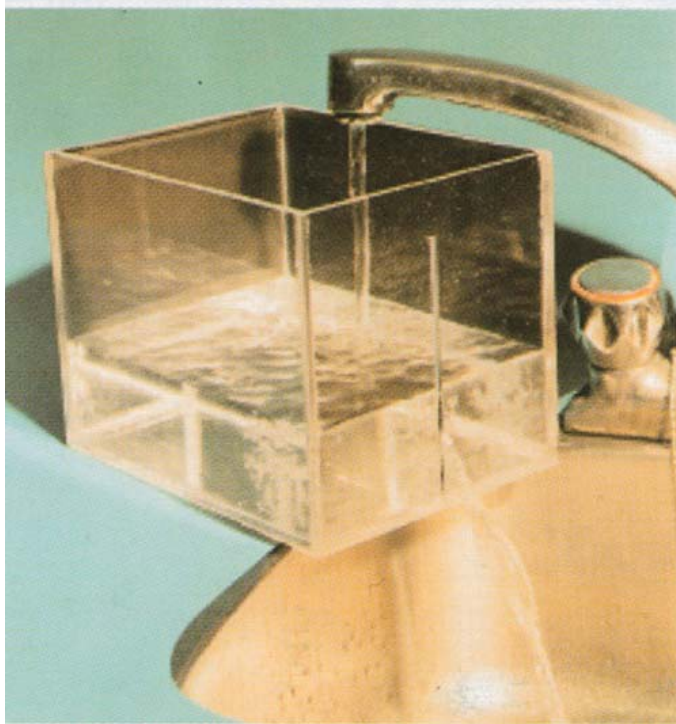
Using a scientific model

Study a scientific model which helps us to picture why the Earth's temperature may change.

What is a model?

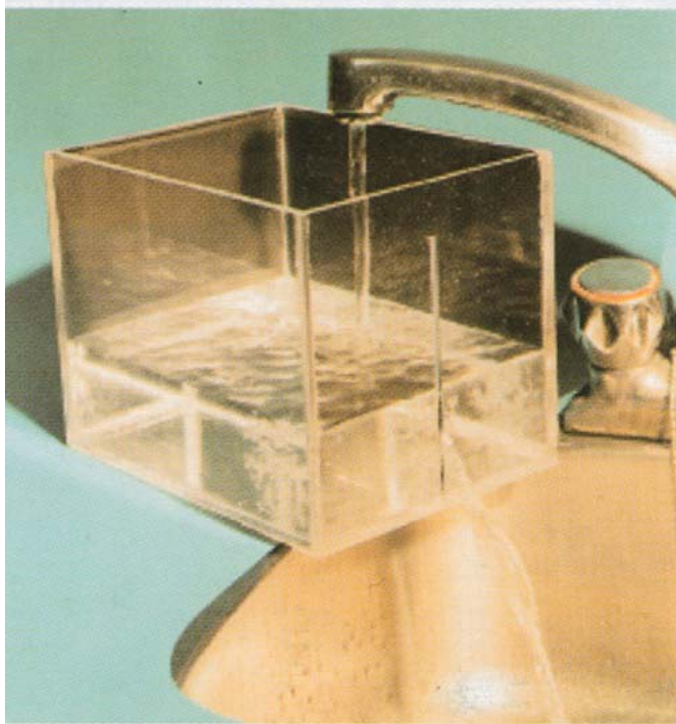
- What do you understand by the word 'model'?
- A scientific model is a way of representing a situation.
- This model allows us to understand how the Earth's temperature depends on the rate at which energy arrives and leaves.

Our model of the Earth and Sun



- Water flows into the tank.
- Water runs out through the hole in the side of the tank.
- Eventually the level becomes constant.

Our model of the Earth and Sun



- Suggest two ways to make the level of water in the tank rise higher.
- What would make the water level fall?

What's what in our model?

In this model, what represents each of the following?

Energy

The temperature of the Earth

Energy arriving from the Sun

Energy radiated by the Earth

You can choose from:

The height of the water

Water flowing from the hole

Water from the tap

The water itself

What's what in our model?

In this model....

Energy is represented by **the water itself**.

Energy arriving from the Sun is represented by **water from the tap**.

Energy radiated by the Earth is represented by **water flowing from the hole**

The temperature of the Earth is represented by **the height of the water**