Edgenuity

# Warm-Up | Tools and Technology

**Lesson Question**

How are tools and technology used in science?

## Lesson Goals

**Examine** how tools and technology are used in science.

**Identify** the use of technology in science.

**Describe** the relationship between science and technology.

**Identify** the function, advantages, and limitations of models in science.

## Words to Know

*Fill in this table as you work through the lesson. You may also use the glossary to help you.*

| | |
|---|---|
| habitable | good enough to live on or in |
| model | a simplified representation of a real object or system |
| tangible | easily seen or touched |
| technology | the application of scientific knowledge to solve problems or create new products |

© Edgenuity, Inc.

# Warm-Up | Tools and Technology

## Science and Society

Science seeks ways to meet the needs of society.

Scientists gain new knowledge.

→ Scientists improve existing products or processes.

→ Scientists design and create new products or processes.

© Edgenuity, Inc.

# Instruction | Tools and Technology

Slide 2

## Science and Technology

**Technology** is the application of [scientific] knowledge to solve problems or create new [products].

Technology:

- aids in collecting and recording data.
- helps process, store, and communicate data.
- influences the progress of scientific [knowledge].

## Observation Tools

Advances in [technology] have led to the [improvement] of telescopes over [time].

Lippershey's [telescope]

Leviathan of Parsonstown

[Hubble] Space Telescope

Gran Telescopio [Canarias]

© Edgenuity, Inc.

# Instruction | Tools and Technology

Slide 2

## Measurement and Calculation Tools

Measurement and calculation tools:

- collect large amounts of [data] in a short amount of time with greater precision.
- display data [quickly] and clearly.
- contain [software] for quick and accurate data analysis.
- store large amounts of data in a very small space.

Slide 4

## Mars Rovers

A Mars rover is a [robotic] vehicle launched into space to land on and explore the surface of Mars. Its purpose is:

- searching for [evidence] of ancient life and ancient water.
- investigating whether the planet is [habitable].

Slide 6

## The Need for Technology

Scientists wanted to make [predictions] about the weather several days into the future.

- Tracking weather events in a broad area can help scientists make better and more complete [weather] predictions.

© Edgenuity, Inc.

# Instruction | Tools and Technology

Slide 6

## The Development of Technology

- Doppler radar can indicate the direction and speed of wind and the boundaries between warm fronts and cold fronts.
- Satellites, weather stations, and other devices collect weather data from around the world.
- Supercomputers can use mathematical calculations to predict weather.

## The Improvement of Technology

Data from satellites, weather stations, and other sources are fed to a supercomputer that makes weather predictions. These data:

- account for current weather.
- account for broad-scale factors, such as air pressure, Earth's rotation, and solar radiation.
- allow forecasters to make more accurate predictions about the weather.

© Edgenuity, Inc.

# Instruction | Tools and Technology

Slide 9

## Models in Science

A **model** is a [simplified] representation of a [real] object or system.

Very large  Very small  Very [complex]

## Models in Science

Several different types of [models] can be used to represent the same thing.

These models may vary in their usefulness, [purpose], and complexity.

[Illustration] or diagram

Science fair model

[Computer] model from USGS

## Advantages of Models

Models make concepts more [tangible] and:

- make it possible to notice [patterns].
- are good tools to develop or revise a representation.
- allow scientists to predict or explain events or relationships.

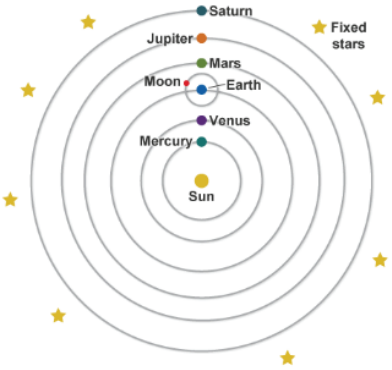
© Edgenuity, Inc.

Slide 9

## Limitations of Models

- Models may be oversimplified.
- Models cannot represent all aspects of an object or a system.
- Models are only as accurate as current scientific knowledge.




© Edgenuity, Inc.

# Summary | Tools and Technology

**Lesson Question**

How are tools and technology used in science?

**Answer**

(Sample answer) Scientists use various tools or devices to conduct scientific investigations. These investigations help advance scientific knowledge. Scientific knowledge can also be used to make advances in technology.

Slide 2

**Review: Key Concepts**

- Technology is the application of scientific knowledge to solve problems or create new products.
- Advances in technology allow for the progression of scientific knowledge.
- Scientific knowledge is used to make advances in technology.

© Edgenuity, Inc.

# Summary | Tools and Technology

Slide 2

## Review: Key Concepts

A model is a simplified [representation] of a real object or system that is very large, very small, or very [complex].

### Advantages

- Make concepts more [tangible]
- Show patterns
- Allow for development or revision of representations
- [Predict] or explain events or relationships

### Limitations

- May be oversimplified
- Cannot represent all aspects of an object or a system
- Are only as accurate as current scientific knowledge

*Use this space to write any questions or thoughts about this lesson.*

© Edgenuity, Inc.