

# **Science IDEAS Energy Binder**

## **Core Concepts**

Motion is the change in position of an object and can be measured using distance, direction, and time, and described using speed, velocity, and acceleration.

An object's motion will always be the same unless acted upon by one or more forces (pushes or pulls).

Energy is the ability to do work and exists in different forms. These forms include thermal, mechanical, chemical, electromagnetic, and nuclear. Energy cannot be created or destroyed, but may be converted from one form to another.

Heat is the transfer of thermal energy from a warmer object to a colder object by conduction, convection, and/or radiation.

Light is a form of energy that travels as waves, which can be reflected, refracted, and/or absorbed.

Sound is a form of energy that travels as waves through a medium, causing the medium to vibrate. Sound travels at different speeds through different mediums.

Work is done when a force is acted upon an object causing it to move in the direction of the force. Simple machines change the amount and direction of the force used.

# **3<sup>rd</sup> Grade Curriculum Plan**

## **Energy Unit**

- **Energy**

Energy is the ability to do work and exists in different forms. These forms include thermal, mechanical, chemical, electromagnetic, and nuclear. Energy cannot be created or destroyed, but may be converted from one form to another.

- Forms of Energy
- Conservation of Energy

- **Heat / Thermal Energy**

Heat is the transfer of thermal energy from a warmer object to a colder object by conduction, convection, and/or radiation.

- Temperature vs. Heat
- Transfer of Heat
  - Conduction
  - Convection
  - Radiation

- **Light**

Light is a form of energy that travels as waves, which can be reflected, refracted, and/or absorbed.

- Waves (wavelength)
- Color
- Transfer
  - Reflection
  - Refraction
  - Absorption (results in conversion to other forms of energy)

# **4th Grade Curriculum Plan**

## **Energy Unit**

- **Energy**

Energy is the ability to do work and exists in different forms. These forms include thermal, mechanical, chemical, electromagnetic, and nuclear. Energy cannot be created or destroyed, but may be converted from one form to another.

- Forms of Energy
- Conservation of Energy

- **Heat / Thermal Energy**

Heat is the transfer of thermal energy from a warmer object to a colder object by conduction, convection, and/or radiation.

- Temperature vs. Heat
- Transfer of Heat
  - Conduction
  - Convection
  - Radiation

- **Light**

Light is a form of energy that travels as waves, which can be reflected, refracted, and/or absorbed.

- Waves (wavelength)
- Color
- Transfer
  - Reflection
  - Refraction
  - Absorption (results in conversion to other forms of energy)

- **Sound**

Sound is a form of energy that travels as waves through a medium, causing the medium to vibrate. Sound travels at different speeds through different mediums.

- Waves
- Production & Travel (vibrations)

- Properties (pitch, intensity)

- **Force and Motion**

Motion is the change in position of an object and can be measured using distance, direction, and time, and described using speed, velocity, and acceleration. An object's motion will always be the same unless acted upon by one or more forces (pushes or pulls).

- Describing Motion
  - Distance, direction, time
  - Speed, velocity, acceleration
- Newton's Laws of Motion
- Types of Forces
  - Gravity
  - Friction

# **5th Grade Curriculum Plan**

## **Energy Unit**

- **Energy**

Energy is the ability to do work and exists in different forms. These forms include thermal, mechanical, chemical, electromagnetic, and nuclear. Energy cannot be created or destroyed, but may be converted from one form to another.

- Forms of Energy
- Conservation of Energy

- **Heat / Thermal Energy**

Heat is the transfer of thermal energy from a warmer object to a colder object by conduction, convection, and/or radiation.

- Temperature vs. Heat
- Transfer of Heat
  - Conduction
  - Convection
  - Radiation

- **Light**

Light is a form of energy that travels as waves, which can be reflected, refracted, and/or absorbed.

- Waves (wavelength)
- Color
- Transfer
  - Reflection
  - Refraction
  - Absorption (results in conversion to other forms of energy)

- **Sound**

Sound is a form of energy that travels as waves through a medium, causing the medium to vibrate. Sound travels at different speeds through different mediums.

- Waves
- Production & Travel (vibrations)

- Properties (pitch, intensity)

- **Force and Motion**

Motion is the change in position of an object and can be measured using distance, direction, and time, and described using speed, velocity, and acceleration. An object's motion will always be the same unless acted upon by one or more forces (pushes or pulls).

- Describing Motion
  - Distance, direction, time
  - Speed, velocity, acceleration
- Newton's Laws of Motion
- Types of Forces
  - Gravity
  - Friction
- Work
- Potential & Kinetic Energy
- Simple Machines