

Matter and Materials Curriculum Map

The activities in this book have two intentions:

1. To teach concepts related to matter and materials.
2. To provide students with the opportunity to apply necessary skills needed for the mastery of science and technology curricula. Throughout the experiments, the scientific method is used.

The experiments and activities fall under three categories:

1. Materials that Transmit, Reflect or Absorb Light and Sound
2. Properties of and Changes in Matter
3. Properties of Air and Characteristics of Flight

In each section you will find:

- Teacher Notes: ideas and suggestions for conducting experiments and completing activities.
- Materials List: items needed to carry out experiments and activities.
- Pre-assessment Quiz: a quick overview of what students already know about the topic.
- Activities and Experiments: simply laid out instructions and worksheets.
- What Have You Learned?: A quick review of concepts covered and a check for student understanding.

Contents Include:

- At A Glance – Skill List
- Teacher Rubric
- Student Rubric
- Introduction

Activities and Experiments

Materials that Transmit, Reflect or Absorb Light and Sound

- Teacher Notes
- Materials List
- Answer Key
- Pre-assessment Quiz
- Student Activities and Experiments
- What Have You Learned?

Building on their present knowledge base, students will begin to examine and explore a variety of materials that absorb, reflect or transmit light and sound. Through a variety of experiments and activities, students will have the opportunity to learn the following:

LIGHT:

- Natural and man-made materials
- How different materials affect light
- Materials that reflect light
- Meaning of transparent, translucent, and opaque
- Identifying materials that are transparent, translucent or opaque
- Formation of shadows: their size, shape, and location
- Characteristics of indoor shadows
- How we see colors
- Changing colors
- Camouflage
- Light in our environment

SOUND:

- Sounds in daily life: messages, uses
- “Feeling” a sound
- Pitch, intensity, and measurement
- Properties of materials and changes in sound

- Materials that reflect or absorb sound
- Echoes: how they occur, applications to the animal and human world
- Categories of sounds and their applications to human life
- Making musical instruments from various materials and playing a song

WHAT HAVE YOU LEARNED:

- An activity to assess student understanding of light and sound energy concepts and terms

Properties of and Changes in Matter

- Teacher Notes
- Materials List
- Answer Key
- Pre-assessment Quiz
- Student Activities and Experiments
- What Have You Learned?

Using their present and prior knowledge base, students will begin to examine and explore the forms of matter and materials that they encounter daily, their sources and their use in our society. Through a variety of experiments and activities, students will have the opportunity to learn the following:

PROPERTIES:

- Definition of Matter
- States of Matter
- Common Properties
- Buoyancy and Density
- Compare and Contrast Properties of States of Matter
- Categorize States of Matter

CHANGES:

- How Temperature Affects Matter

- Changes in Matter
- Physical and Chemical Changes
- Reversible and Non-reversible Changes
- Measuring Matter
- Design and Construct a “Cooler” and Present Results.

WHAT HAVE YOU LEARNED:

- An activity to assess student understanding of the properties of matter and the terms used in relation to this topic.

Properties of Air and Characteristics of Flight

- Teacher Notes
- Materials List
- Answer Key
- Pre-assessment Quiz
- Student Activities and Experiments
- What Have You Learned?

Using their present and prior knowledge base, students will begin to examine and explore the properties of air. They will investigate the characteristics of flight and its application in our society. Through a variety of experiments and activities, students will have the opportunity to learn the following:

PROPERTIES OF AIR:

- Definition of Air
- Air Takes up Space
- How Temperature Affects Air
- Effects of Air Pressure

CHARACTERISTICS OF FLIGHT:

- Gravity and Air
- Air in Motion
- Bernoulli's Principle

- Super Flyers: Construct Paper Flyers and Test Their Features

RESEARCH:

- Topic: Milestones in the History of Flight
- Research a person and present results.
- Relate the information to the present and the future of flight.

WHAT HAVE YOU LEARNED?

- An activity to assess student understanding of the properties of air and the characteristics of flight and the terms related to this topic.