

4th Grade Matter Unit

Benchmarks

Chapter 1: The Nature of Science

The Scientific World

1A(3-5)#1: Results of similar scientific investigations seldom turn out exactly the same. Sometimes this is because of unexpected differences in the things being investigated, sometimes because of unrealized differences in the methods used or in the circumstances in which the investigation is carried out and sometimes just because of uncertainties in observations. It is not always easy to tell which.

The Physical Setting

Structure of Matter

4D(3-5)#1: Heating and cooling cause changes in the properties of materials. Many changes in the properties occur faster under hotter conditions.

4D(3-5)#4: When a new material is made by combining two or more materials, it has properties that are different from the original materials. For that reason, a lot of different materials can be made from a small number of basic kinds of materials.

Energy Transformations

4E(3-5)#2: When warmer things are put with cooler ones, the warm ones lose heat and the cool ones gain it until they are all at the same temperature. A warmer object can warm a cooler one by contact or at a distance.

Introduction to 4E(3-5)#3: Some materials conduct heat much better than others. Poor conductors can reduce heat loss.

Habits of Mind

Values and Attitudes

12A(3-5)#1: Keep records of their investigations and observations and not change the records later.

Manipulation and Observation

12C(3-5)#2: Measure and mix dry and liquid materials in prescribed amounts, exercising reasonable safety [and demonstrating correct lab techniques].

12C(3-5)#3: Keep a notebook that describes observations made, carefully distinguishes actual observations from ideas and speculations about what was observed, and is understandable weeks or months later.

12C(6-8)#3: Use analog and digital meters on instruments used to make direct measurements of length, volume, weight, elapsed time, rates, and temperature, and choose appropriate units for reporting various magnitudes.

Communication Skills

12D(3-5)#3: Use numerical data in describing objects and events.

Introduction to 12D(6-8)#1: Organize information in simple tables and graphs and identify relationship they reveal. (See essay on page 76 in *Benchmarks* about the importance of student-generated tables and graphs at this grade level.)

Critical-Response Skills

12E(305)#2: Recognize when comparisons might not be fair because some conditions are not kept the same.

Illinois Performance Descriptor: Students will design and conduct experiments