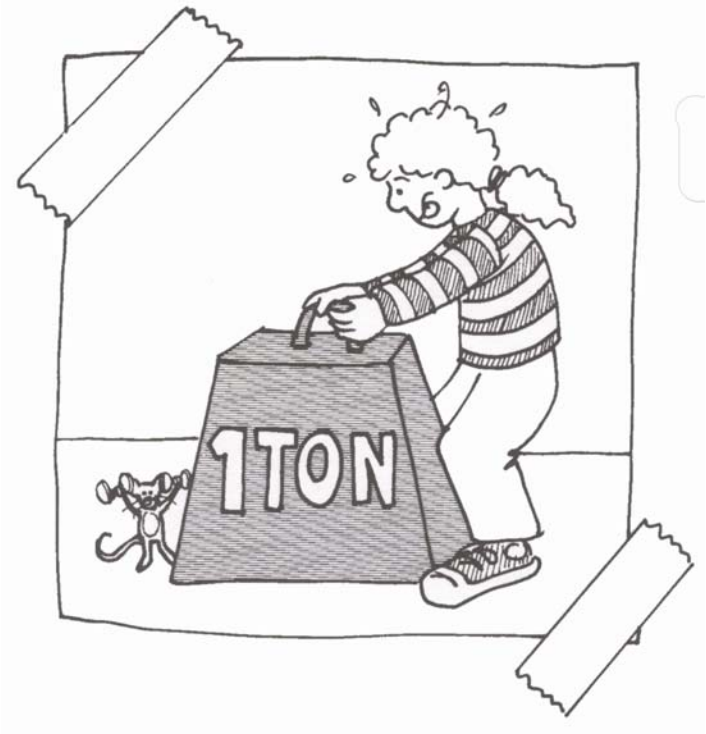


Chapter Four, Lesson Two

What it Takes to Make a Ton

Concepts and Skills Addressed:

Social Science
Problem Solving

Materials Needed:

None

Materials Supplied:

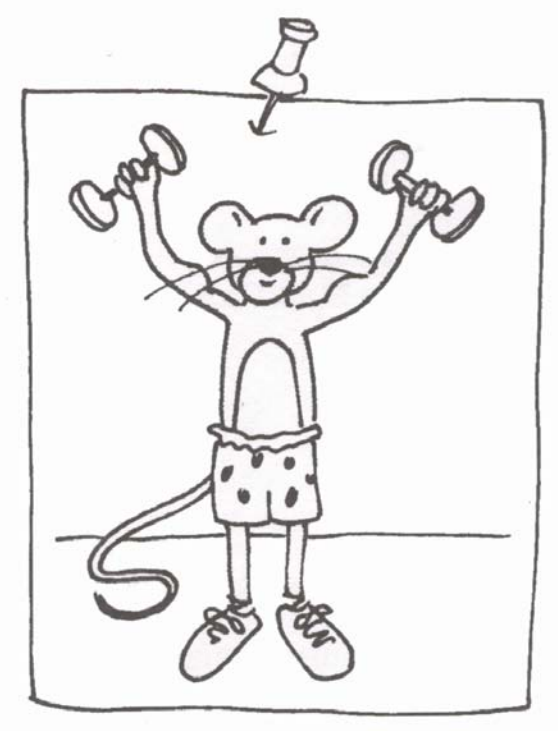
None

Students will learn how raw materials and our resources can be preserved through recycling.

A. Procedure:

1. Read through the material "What it Takes to Make a Ton," which follows.
2. Divide the class into the four groups discussed and give each group a list of the "Resources Saved by Recycling" found here for paper, glass, aluminum, and steel. Figures are not available for plastic and other resources, so these will have to do. The point is that we can be responsible for our environment by learning more about it.
3. Ask each group to discuss briefly how saving these resources can benefit the world.

4. Designate a writer in each group to jot down the ideas and to tell the rest of the class the resources that are preserved and how that benefits the world.
5. At the end of the discussion explain that there are other recyclables you have not yet talked about (namely plastic, yard and food waste) and that you'll talk about some of these things in more detail later.



B. What it Takes to Make a Ton

Making a ton of something equaling 2,000 pounds (900 kilograms), takes a lot of material. We can use either raw materials or recycled materials to make the same items. By looking at the difference between two ways of making the same thing, we can learn how our environment is helped or hurt by our decisions.

To Make a Ton of Paper:

We Use These Raw Materials

- 3,688 lbs. of wood
- 216 lbs. of **lime**
- 360 lbs. of **salt cake**
- 76 lbs. of **soda ash**
- 24,000 gallons of water
- 28 million **BTUs** of energy

We Would Have to Treat and Dispose of

- 84 lbs. of air **pollutants**
- 36 lbs. of water pollutants
- 176 lbs. of solid waste

Resources Saved by Recycling Paper

Recycling one ton of newspaper

- is the equivalent of one ton of paper made from about 17 trees
- conserves two to three cubic yards of landfill space; that's a box three feet tall, three feet wide and six to nine feet long.

To Make a Ton of Glass:

We Use These Raw Materials

- 1,330 lbs. of sand
- 433 lbs. of **soda ash**
- 433 lbs. of **limestone**
- 151 lbs. of **feldspar**
- 15.2 million BTUs of energy

We Would Have to Treat and Dispose of

- 32.5 lbs. of mining waste
- 8 lbs. of air pollutants

Resources Saved by Recycling Glass

If we use a mixture of ½ recycled glass and ½ raw materials, we reduce

- water consumption by 50%
- mining wastes by 79%
- air pollutants by 14%

To Make a Ton of Aluminum:

We Use These Raw Materials

- 8,766 lbs. of **bauxite**
- 1,020 lbs. of **petroleum coke**
- 966 lbs. of soda ash
- 327 lbs. of **pitch**
- 238 lbs. of lime
- 197 million BTUs of energy

We Would Have to Treat and Dispose of

- 3,290 lbs. of **red mud**
- 2,900 lbs. of carbon dioxide
- 81 lbs. of air pollutants
- 789 lbs. of solid wastes.

Resources Saved by Recycling Aluminum

Recycling aluminum reduces

- water consumption by 95%
- energy use by 95%
- air pollutants by 95%

To Make a Ton of Steel:

We Use These Raw Materials

- 1,970 lbs. of iron **ore**
- 791 lbs. of petroleum coke
- 454 lbs. of lime
- 29 million BTUs of energy

We Would Have to Treat and Dispose of

- 538 lbs. of solid wastes
- 42 lbs. of air pollutants

Resources Saved Recycling Steel

Recycling steel reduces

- energy consumption by 74%
- air pollutants by 86%
- water used by 40%
- water pollutants by 76%
- mining wastes by 97%