

# CLASSROOM ENERGY Poster Puzzle

Energy Efficiency Association of Alberta, Canada  
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## **Energy Matters...Use it Wisely!**

Grade Four Teachers!

Assemble the 21 pages enclosed and make a huge bulletin board poster!

The poster depicts energy use and abuse in a classroom. The poster puzzle is a useful teaching aid for any grade four teacher wishing to incorporate energy conservation into the regular teaching program.

### **What does it look like?**

**It is big! It is attractive!**

When completely assembled, it should look like the puzzle master page below. Each puzzle component has been numbered for reference purposes.

### **What to do?**

**You have a number of choices!**

1. You could simply assemble the poster as provided on a bulletin board of adequate size and use the poster as a teaching center. If you do, then some key activities for students might be:

- (a) Describe various ways electricity is used in the poster classroom;
- (b) Describe how heat energy is supplied and used in the poster classroom;
- (c) Tell how energy is being wasted; and
- (d) Tell how energy could be used more wisely in this room.

2. Alternatively, you could make five copies of puzzle pieces 3, 4, 5, 10, 11 and 12 and distribute them to teams of six students. Have them assemble this portion of the puzzle, tape it together and respond to the activities described in option one (above). Later, add other pieces and build the whole picture gradually, discussing additions as they are added.

3. Or, as they are added, you could give each student one section to study, color and describe. Then, as a group, review the energy uses and abuses in each puzzle piece. (The following page by page descriptions should help.)

4. Or, you could have students mark in red all the problems and abuses of energy seen in the completed puzzle poster. Follow this with a discussion of solutions to the problems and abuses.

**Note: If students are to color individual puzzle pieces, make sure that those portions of the puzzle that extend through more than one puzzle piece are similarly colored.**

### **Things for Students to Consider**

Each puzzle component has a number of features illustrated that relate either directly or indirectly to the use of abuse of energy. To assist you in your discussions of the poster, each puzzle component is described below in terms of energy relevancy.

#### **Puzzle piece #1, Window with Sun**

- a. The sun is the ultimate source of the earth's energy supply providing heat and light to the room.
- b. Windows open in winter are wasteful of energy.
- c. Cracked glass causes cold air leakage.
- d. Icicles may indicate a poorly insulated attic causing the roof snow to melt.

#### **Puzzle piece #2, Window with Car**

- a. Incandescent lights are not as energy efficient as fluorescent lights.
- b. On a sunny day, raise the blinds and turn off the lights to save energy.
- c. Cars consume non-renewable energy, gasoline.
- d. Sugar contains food energy that originally came from the sun.

#### **Puzzle piece #3, Kettle and Fan**

- a. Clocks use electricity although only a very small amount.
- b. A kettle uses a relatively large amount of electrical energy so should be turned off as the water comes to a boil.
- c. A fan should not normally be necessary in a classroom in winter, if the room temperature is set properly.
- d. A crack in the wall could allow cold air to leak in.

**Puzzle piece #4, Teacher at Desk**

- a. The radio requires electrical energy although only a small amount. (It gives off sound energy and heat.)
- b. Plants need light energy to survive and grow.
- c. The apple provides food energy to the teacher.
- d. An electric pencil sharpener may be a waste of electricity and pencils, although it uses very little energy for its operation.

**Puzzle piece #5, Thermostat and Flag**

- a. A manual clock stores energy in a spring when wound up.
- b. A desk lamp uses electric energy and could be useful if only a small area of the room needs to be lit.
- c. A thermostat is very important as a regulator of temperature in a room and should be adjusted carefully so as not to waste heat energy. (Note the setting could be lower.)
- d. The poster illustrates wind power, an alternative source of energy that is renewable.

**Puzzle piece #6, Window with Birds**

- a. Incandescent lights are not as energy efficient as fluorescent lights.
- b. A thermometer can help monitor a room's temperature but should best be hung away from cold walls and windows.
- c. The crack in the wall at the corner of the window could cause cold air to leak in and should be sealed.
- d. Windows should have weather-stripping.
- e. Windows should be at least double glazed (two layers of glass) to help reduce heat loss.
- f. Birds require food energy for survival which they can get from seeds.

**Puzzle piece #7, T.V. and Picture**

- a. The wall picture illustrates the historically important use of wind power as an energy source.
- b. The electronic equipment shows a T.V. monitor left on and not being used, thus, a waste of energy.
- c. The digital clock is a very minor user of energy but seems unnecessary if there are other clocks in the room
- d. The crack in the wall is a potential source of a cold draft that would waste room heat.
- e. Sound energy is being released.

**Puzzle piece #8, Boy, Girl and Projector**

- a. Electrical energy is being used by the projector to sort slides, and thus energy may be wasted if the projector light is on just for sorting.
- b. The projector probably has a fan built in that uses energy as well.
- c. The sandwich and drink contain food energy.

### **Puzzle piece #9, Record Planer and Books**

- a. The wall outlet is a connector for appliances and equipment requiring electricity.
- b. Outlets can leak cold air into a room and in some buildings special plugs are used to seal the holes when not being used.
- c. The heat register is the adjustable warm air vent that brings heated air from the school furnace room into the classroom.
- d. The bookshelf should not be placed so that it restricts the flow of air from the heat register.
- e. The record player is another user of electricity and should not be left on if not being listened to.
- f. The apple and milk contain food energy.
- g. The styrofoam cups are produced from non-renewable energy sources, are non-recyclable and therefore an apparent waste of energy.

### **Puzzle piece #10, Boy with Soup and Sandwich**

- a. The electrical outlet “plug-ins” indicate a great deal of electricity being used.
- b. The multiple use of the outlet is very unsafe and should never occur.
- c. The drawing of the airplane reminds us of the use of petroleum products for transportation.
- d. The electric train set shows how some toys may employ energy.
- e. The soup and sandwich contain food energy.

### **Puzzle piece #11, Boy with Ukelele**

- a. The picture taped to the desk indicates the use of energy by industries.
- b. The other picture shows the all important presence of the sun as an ultimate energy source.
- c. The boy must use his energy to create sounds.
- d. Sound is a form of energy.

### **Puzzle piece #12, Girl and Cymbals**

- a. The motorcycle in the picture is an energy user which is fairly efficient in comparison to many other motorized vehicles.
- b. The electrical outlet is unsafe when overloaded as shown.
- c. The space heater consumes a great deal of electricity which is converted to heat by causing the wires to glow.
- d. The boy is wearing a sweater which is one way to conserve room heating energy.
- e. The girl is using body energy to make the cymbals give off sound energy.

### **Puzzle piece #13, Gro-lux and Plants**

- a. The fluorescent tube light is more efficient than incandescent lighting. The close proximity of a window indicates that a better alternative might be natural solar energy.
- b. The plants must have light energy for growth and survival.
- c. The fish will have energy requirements similar to other animals.
- d. The food supplies energy for the fish’s survival.
- e. The wall spot-light consumes electrical energy. The amount is dependent on the bulb size and the length of time it is on. It also gives off heat energy.

**Puzzle piece #14, Girl and Aquarium**

- a. The wall outlet is the electrical connector for the equipment close by.
- b. The tape recorder and speakers represent users of electrical energy for recording and playing back sounds.
- c. The aquarium contains fish and plants and each require energy, the former through food, the latter with light.
- d. The air pump is run by a small electric motor that consumes energy.
- e. The fish food supplies energy to the fish.

**Puzzle piece #15, Boy and Copier**

- a. The boy is wearing a sweater which is one way to conserve energy necessary to heat the classroom.
- b. The waste basket is filled with paper which could probably be recycled. Recycling helps to conserve energy and trees otherwise necessary to make new paper.
- c. The copier requires electrical energy for its operation which involves numerous energy conversions (chemical, light and mechanical) and the creation of waste heat energy.
- d. The copier setting of 20 may or may not indicate wasteful use of the copier. (Note only 14 students in room.)

**Puzzle piece #16, Girl and Copier**

- a. The copier requires electricity for its operation.
- b. Recycling paper is one way to save both on energy and tree resources.
- c. Both pop bottles and cans are recyclable. Recycling is a way to save energy and resources.

**Puzzle piece #17, Girl and Calculator**

- a. The garbage can contains a number of things that could probably be recycled to save both energy and resources.
- b. The girl has a sweater that she can wear if the room temperature is reduced.
- c. The calculator requires an energy source in the form of a battery which stores and supplies a small amount of electrical energy necessary for its operation.
- d. The thermometers represent important instruments for energy studies (such as the heat distribution in a classroom).

**Puzzle piece #18, Boy at Desk**

- a. The graph might show classroom temperature data for a single day, a week or even a month of studies.
- b. Energy conservation rules could be made up for any classroom.
- c. The rug acts as an insulator and appears to feel warmer than the “cold” floor (which in contrast is a good conductor of heat away from a warm body.)
- d. The books are reminders that much can be learned about energy from books in the library.

**Puzzle piece #19, Boy and Microscope**

- a. Microscopes sometimes require electrical energy to supply enough light for proper viewing.
- b. The “science reports” are reminders that energy can also be studied. In some cases, experiments (especially on the temperature of things) can be made into reports.
- c. The electrical outlet is a connector for appliances and equipment requiring electricity.
- d. The humidifier is an energy user and is important in making a living space comfortable.

**Puzzle piece #20, Girl and Burner**

- a. The thermometer in the container is an instrument to determine the amount of heat energy present.
- b. The burner uses natural gas which is a non-renewable energy source.

**Puzzle piece #21, Sink and Candle**

- a. The candle is not being used and its heat and light energy thus wasted.
- b. The dripping tap may waste water but may also waste the energy needed to warm the water.
- c. The head-set on the reader requires electrical energy for its operation.

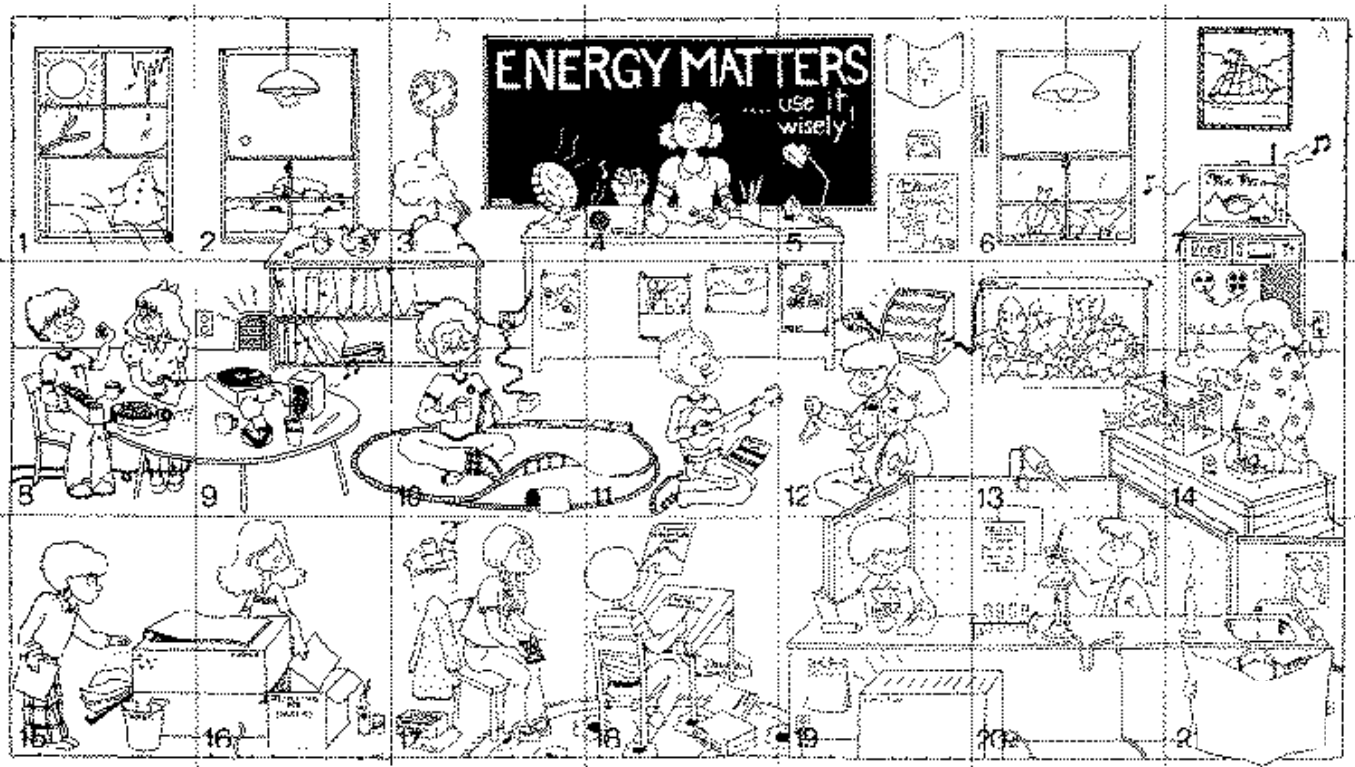
This Poster Puzzles was created by:

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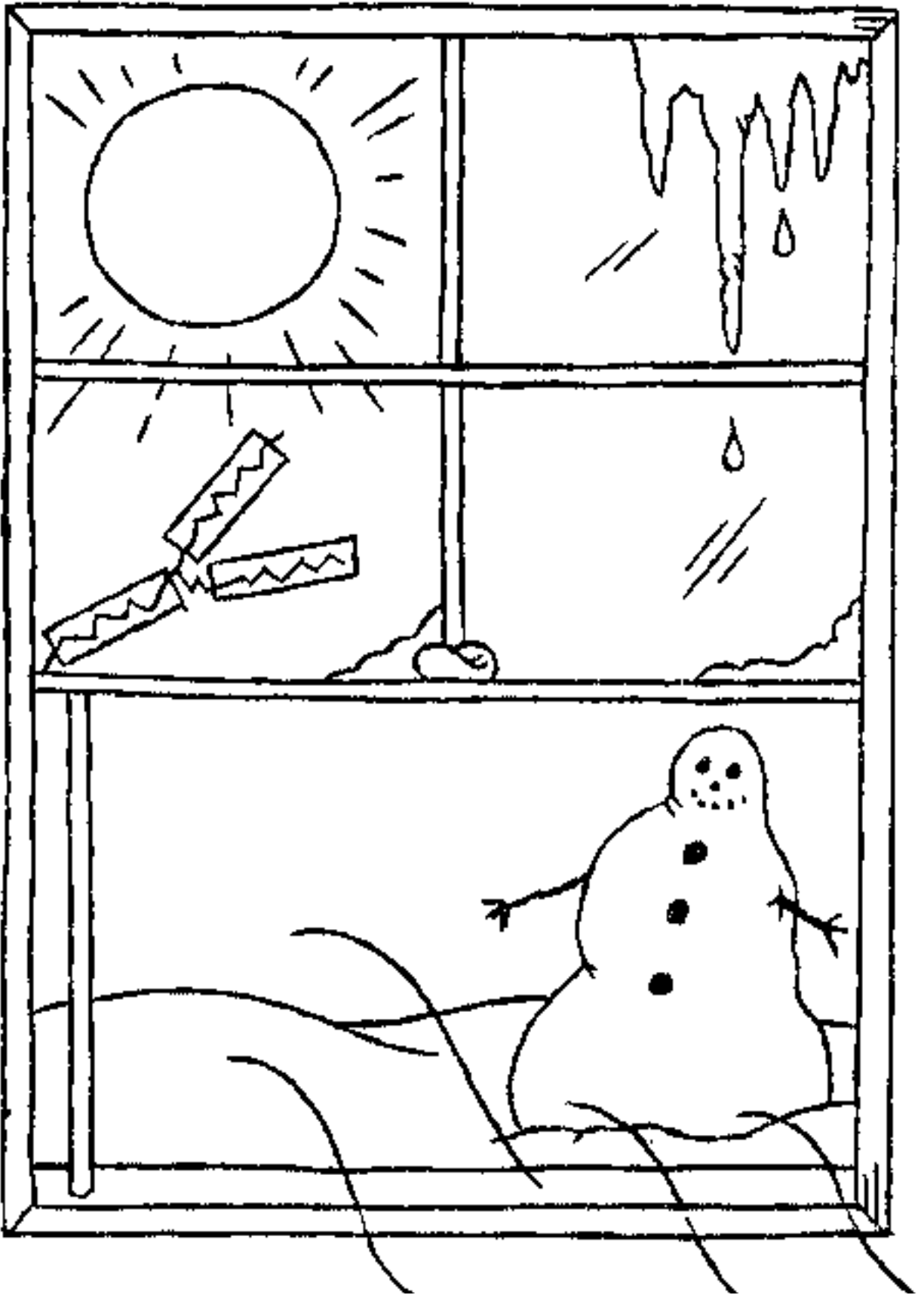
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**What the poster looks like when all put together.  
The poster is about five feet wide by 33 inches tall.**



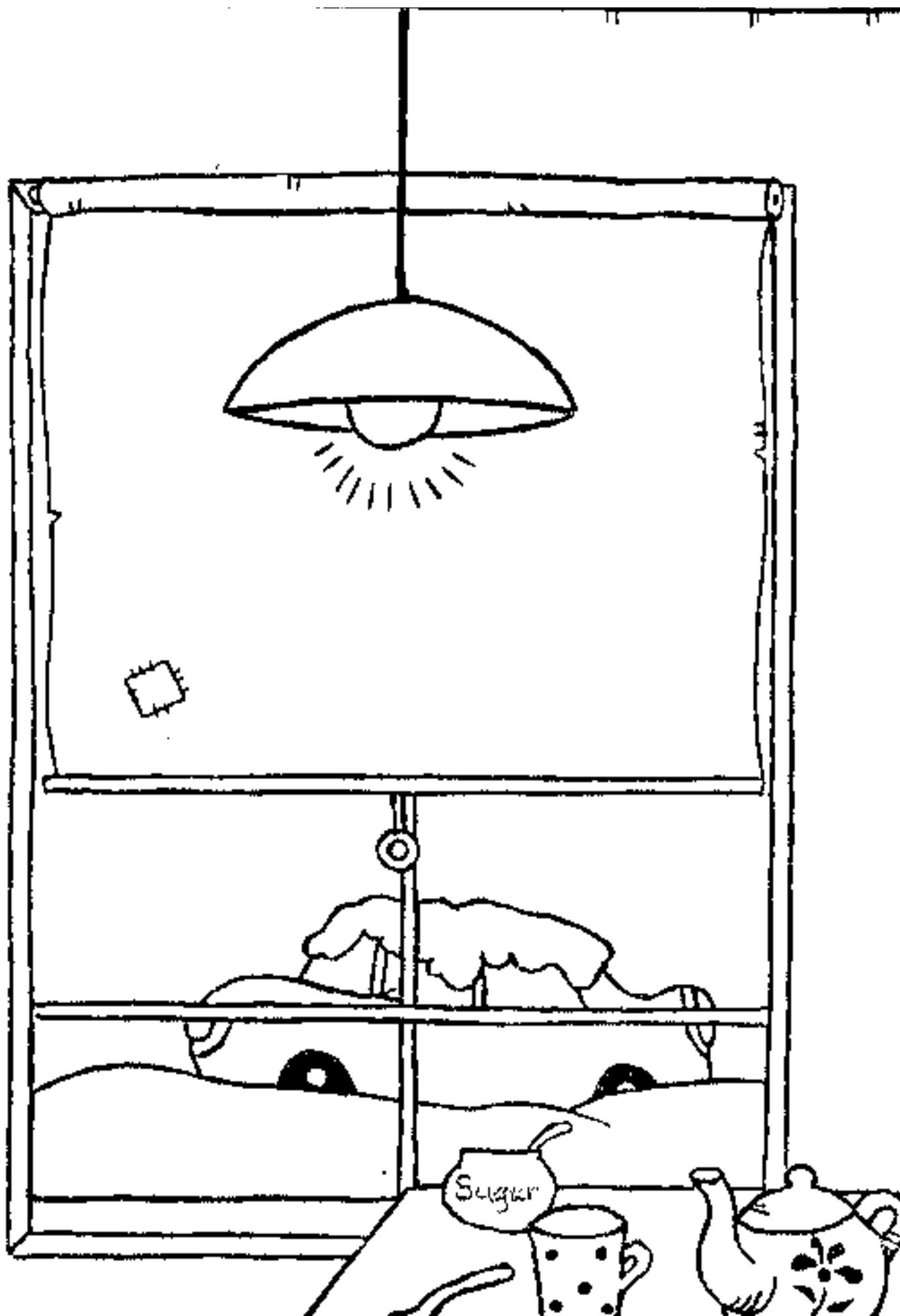
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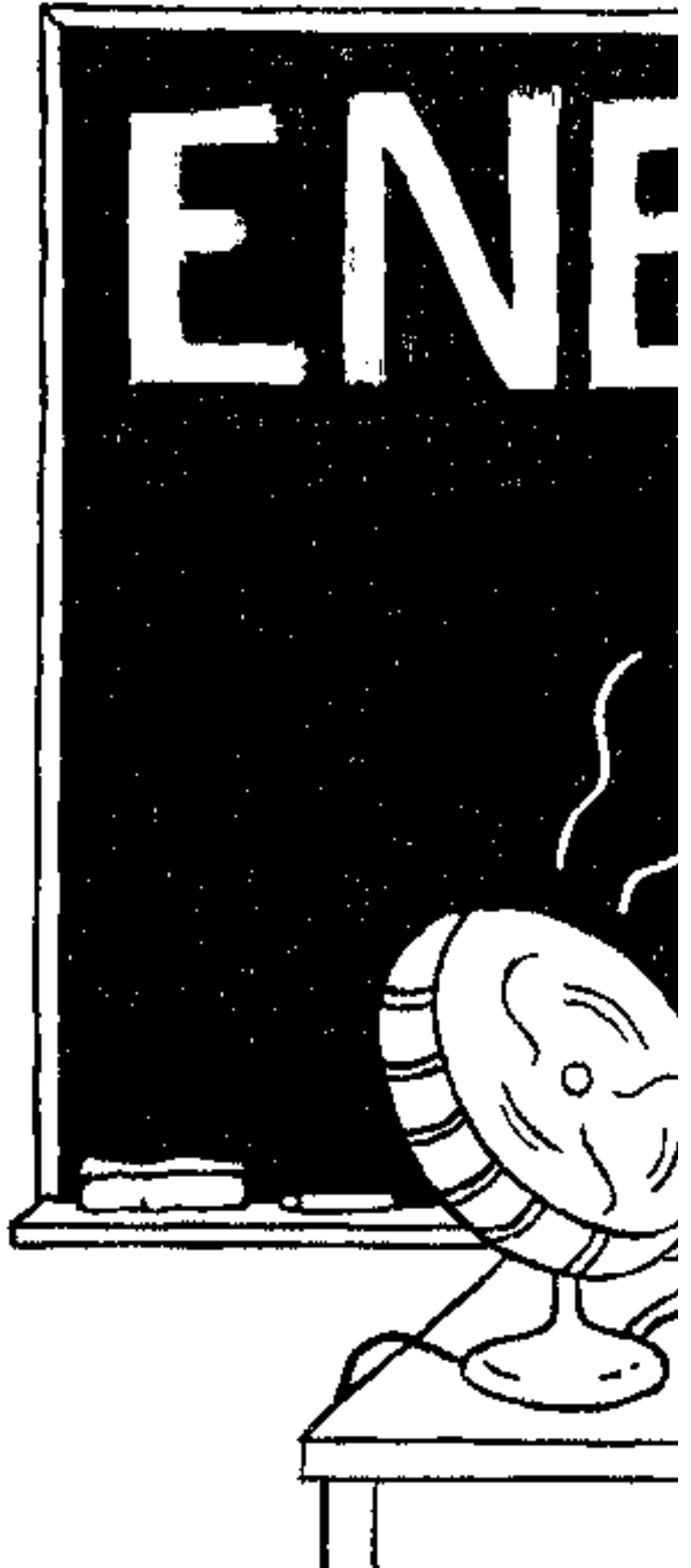
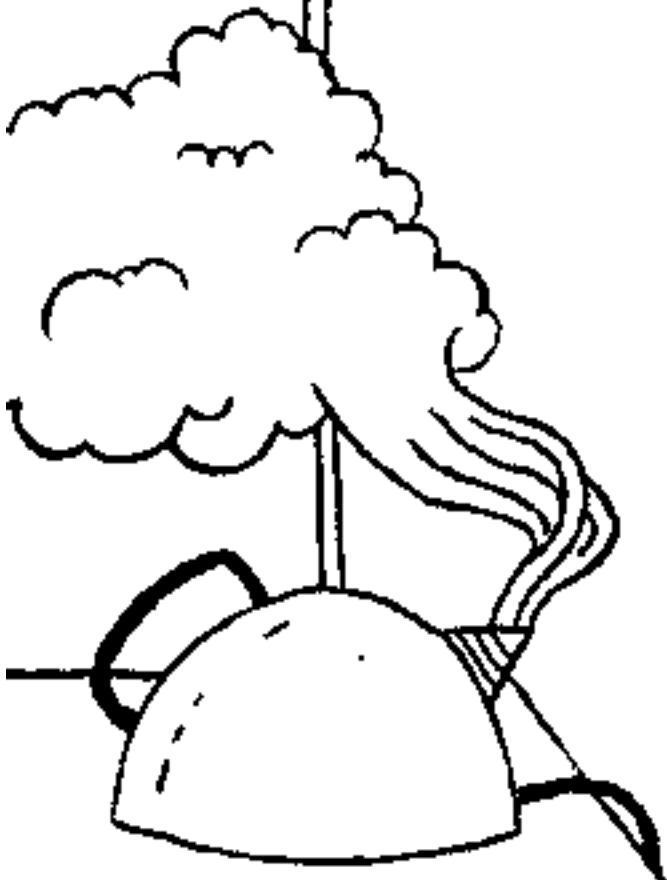
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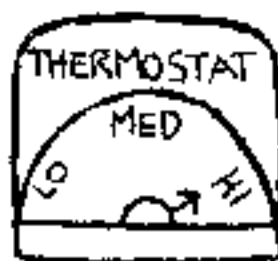
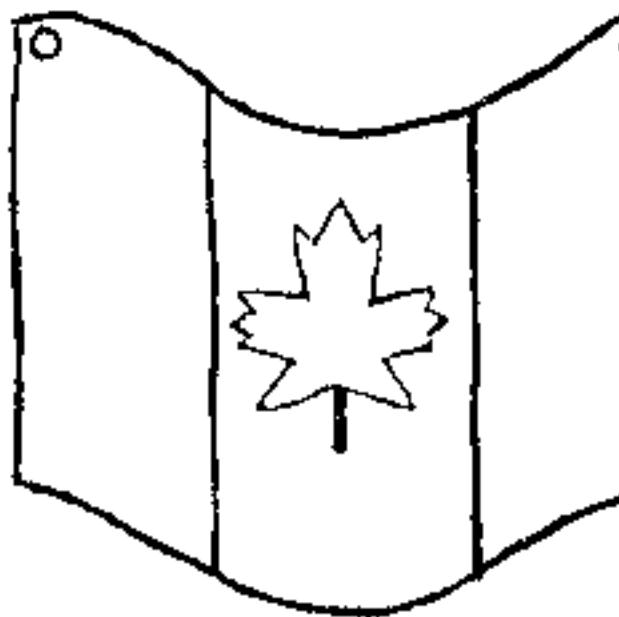
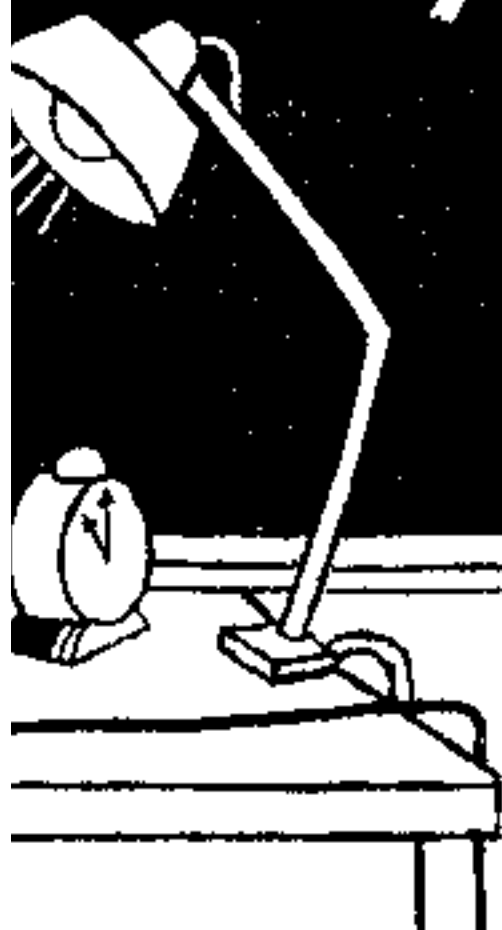
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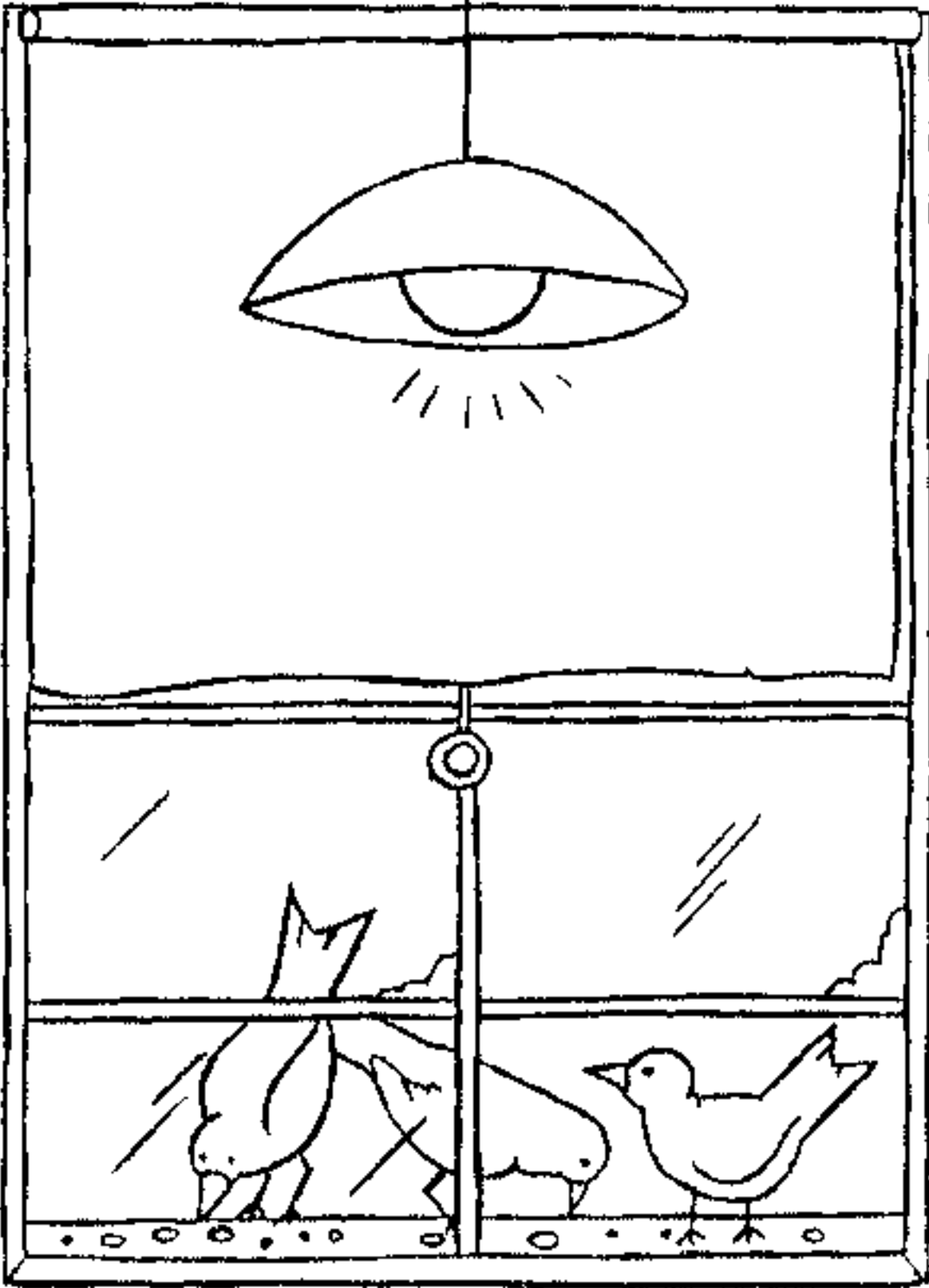


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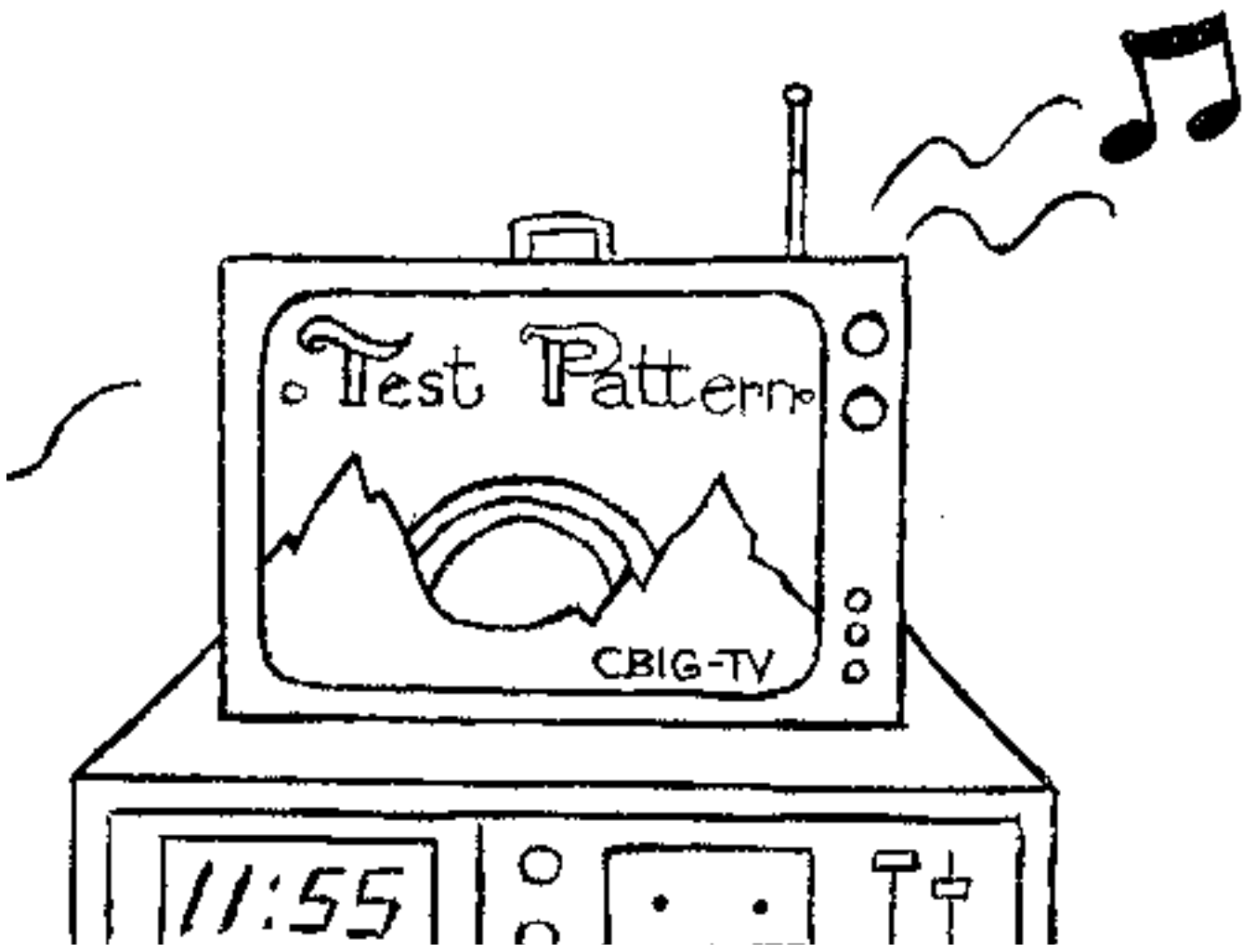
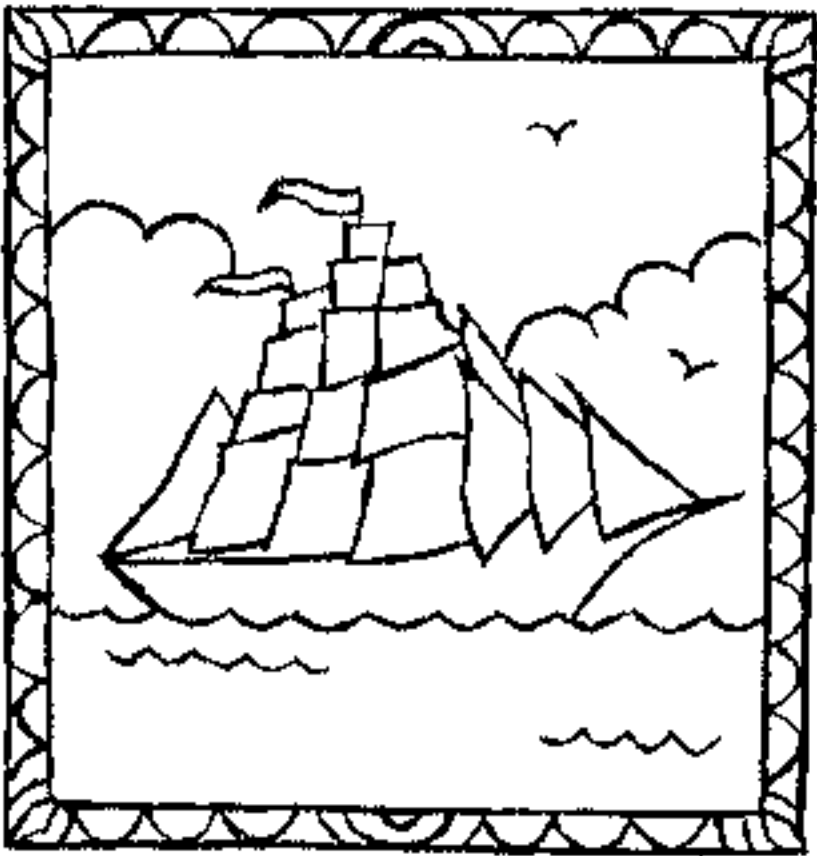
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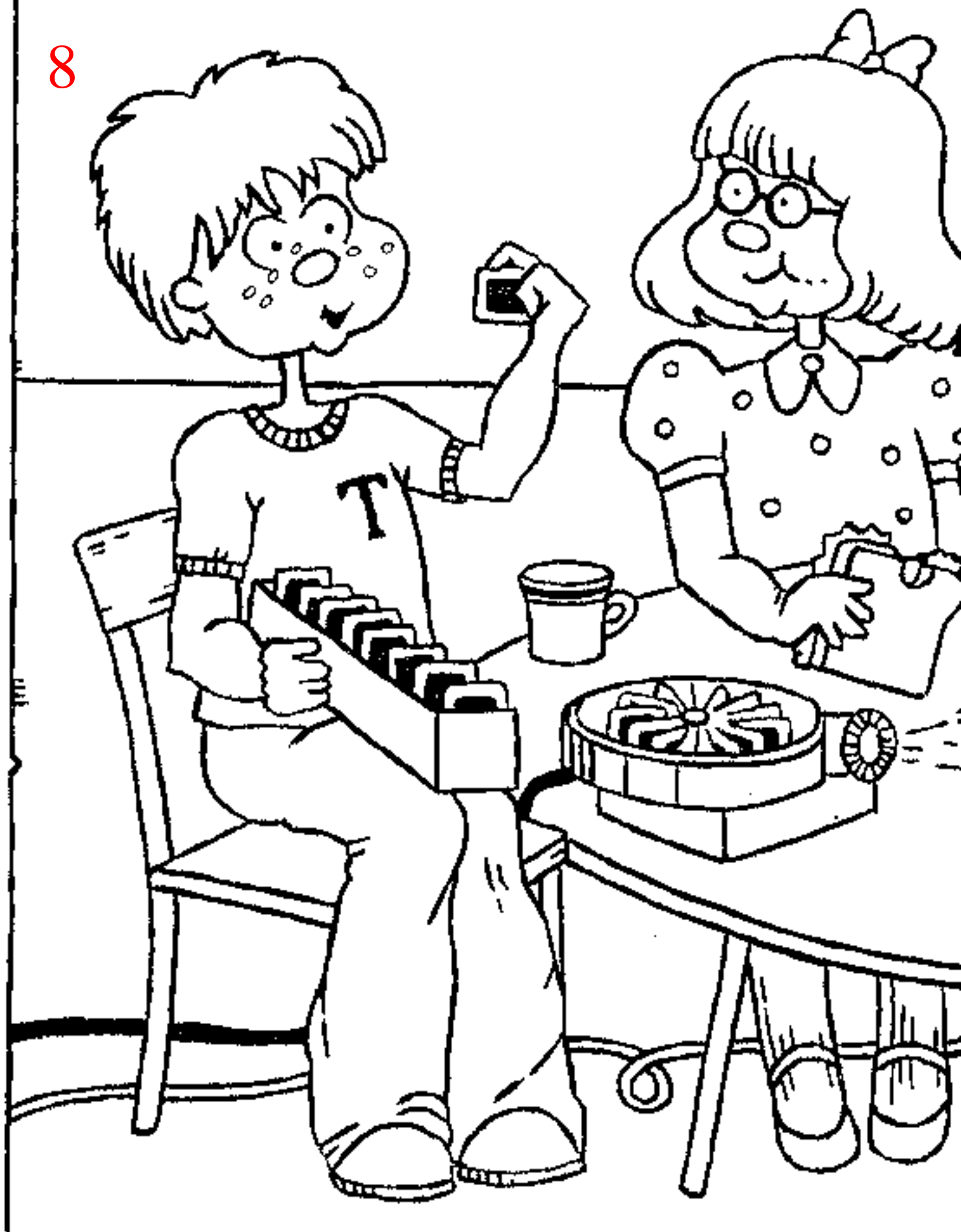
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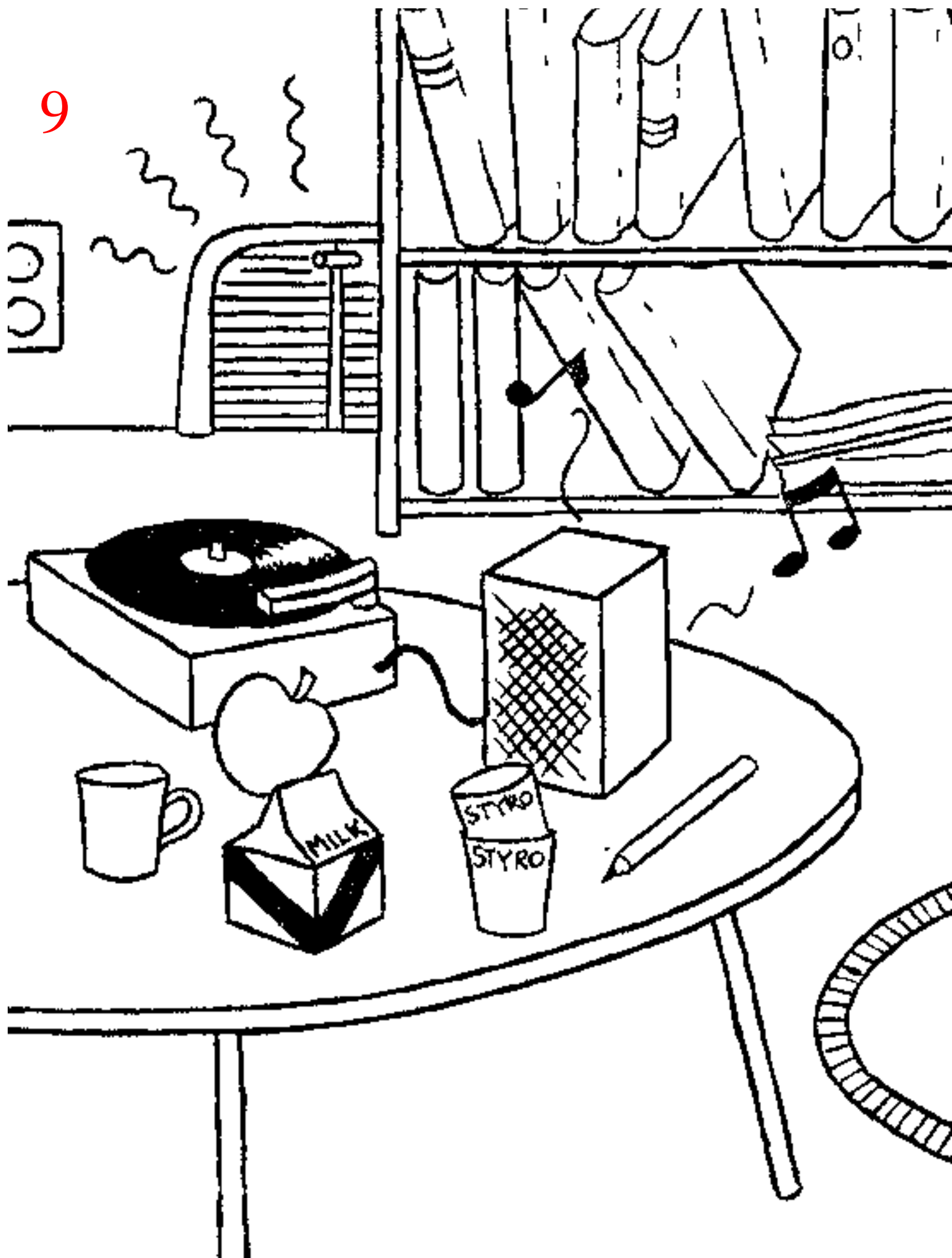


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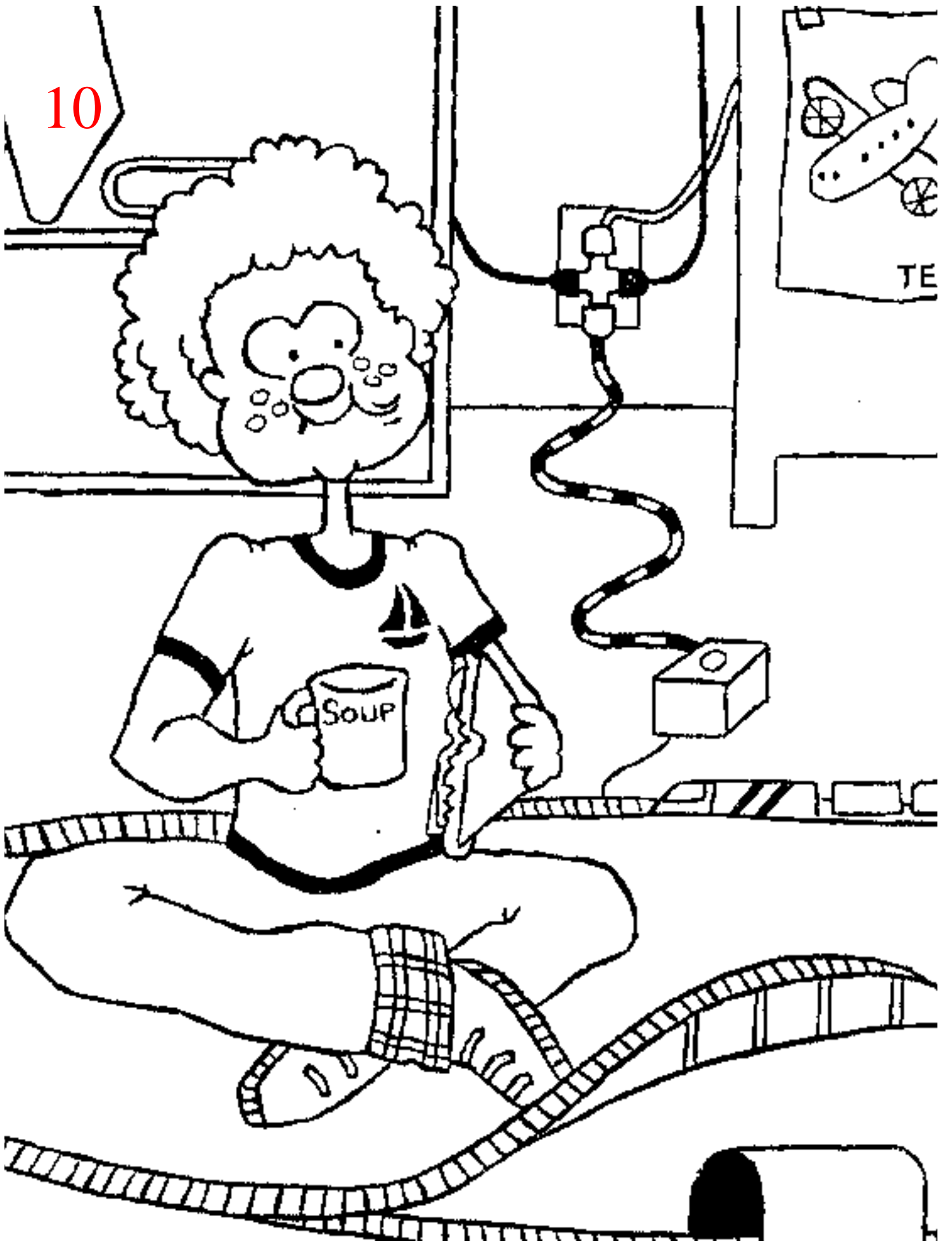


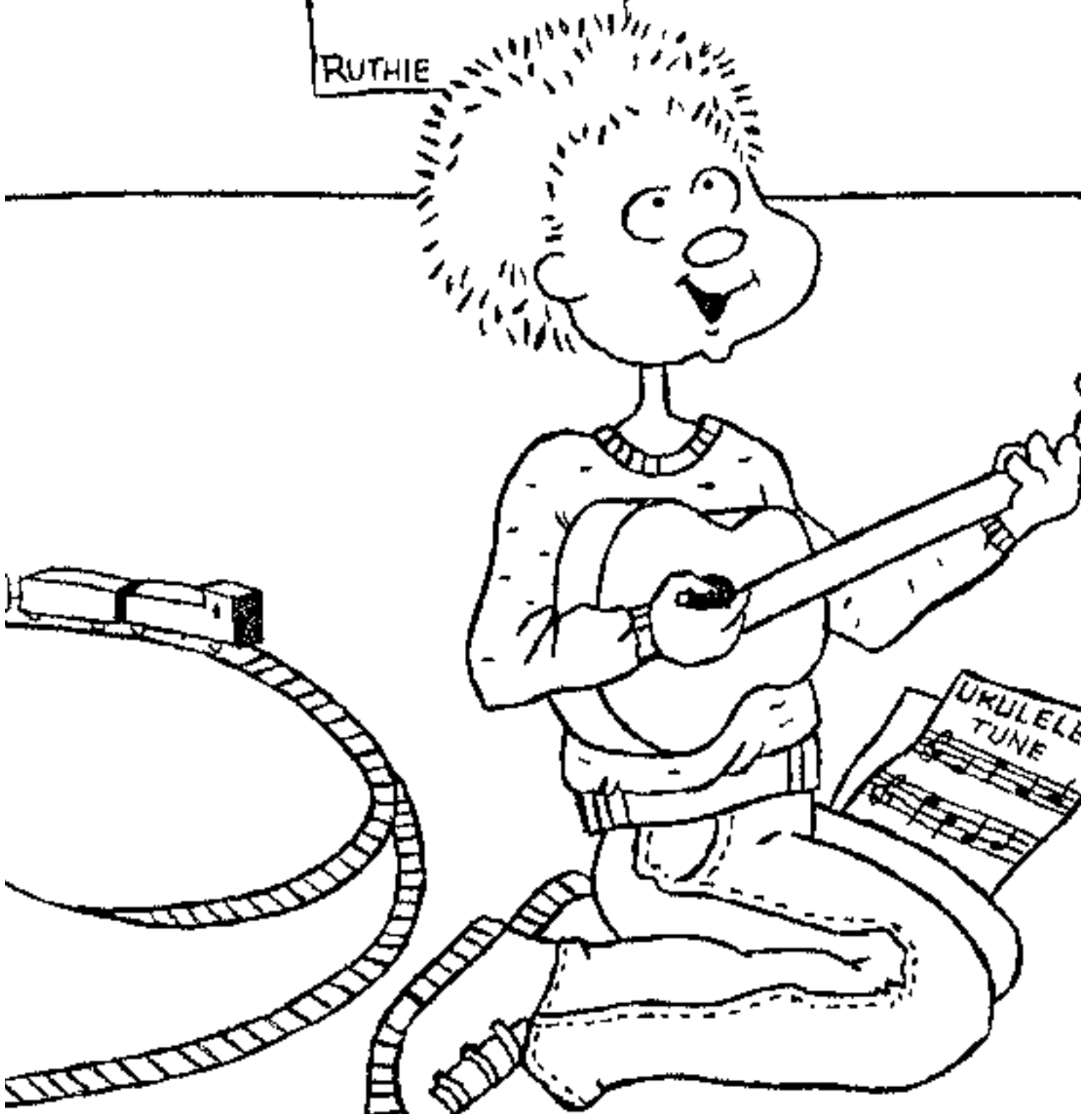
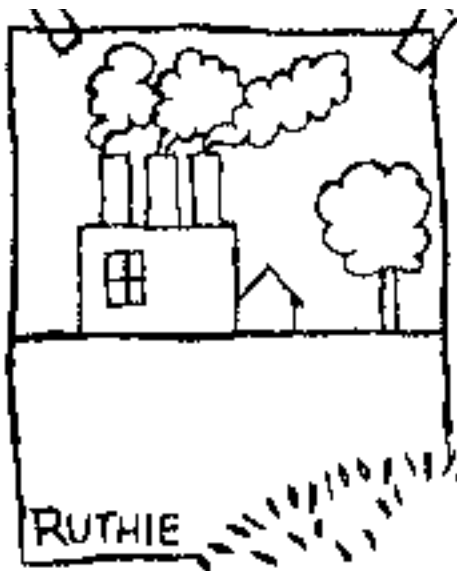
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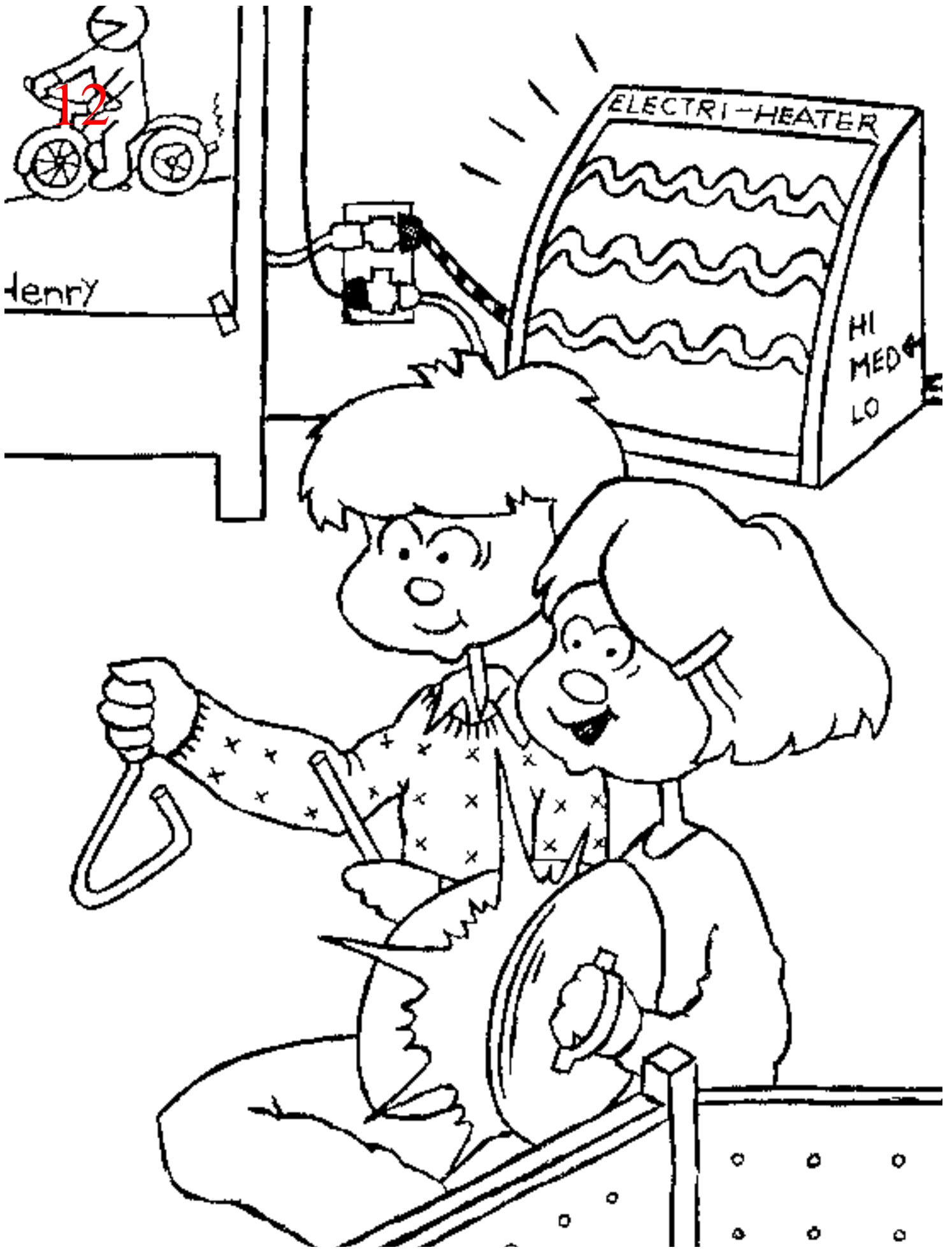






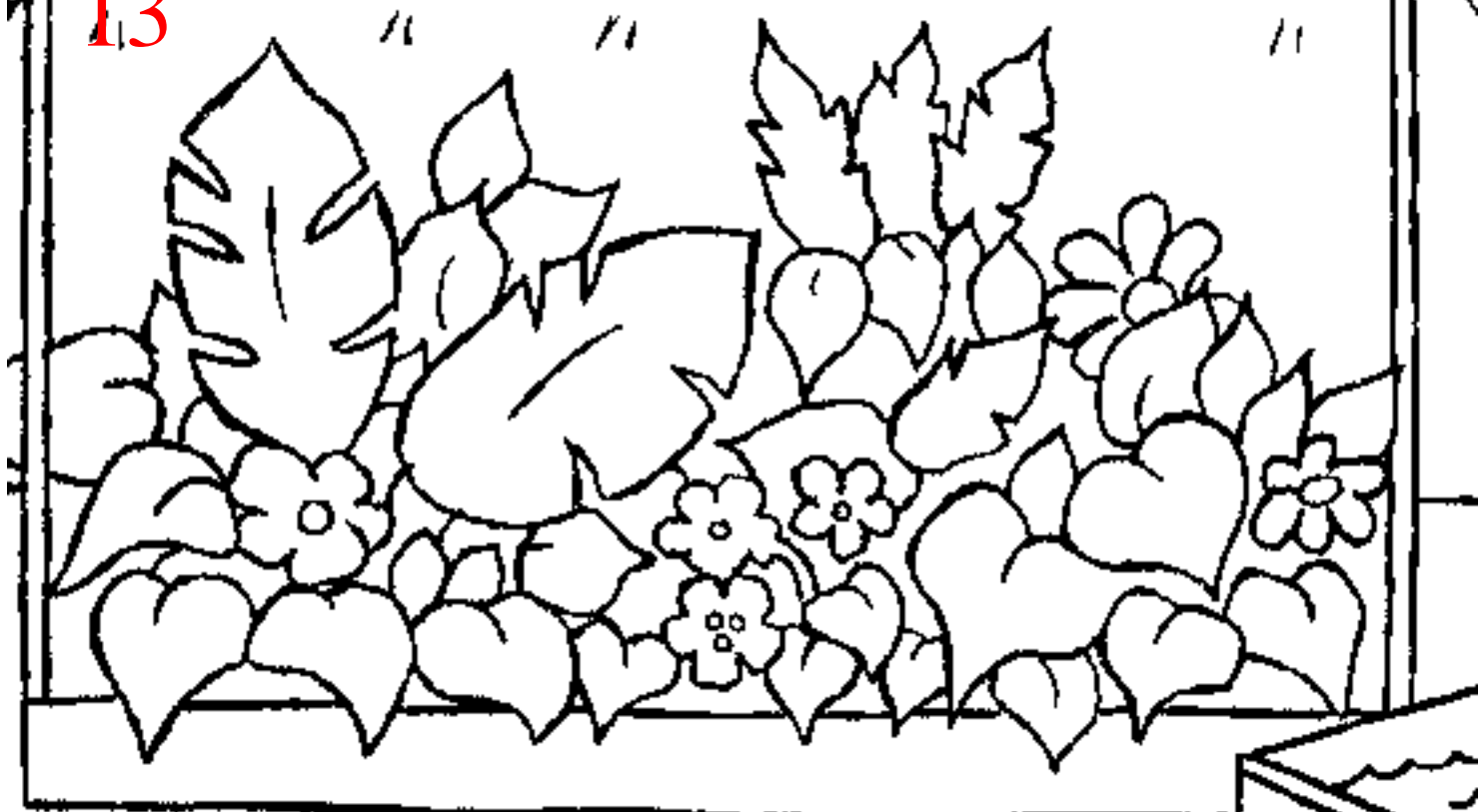


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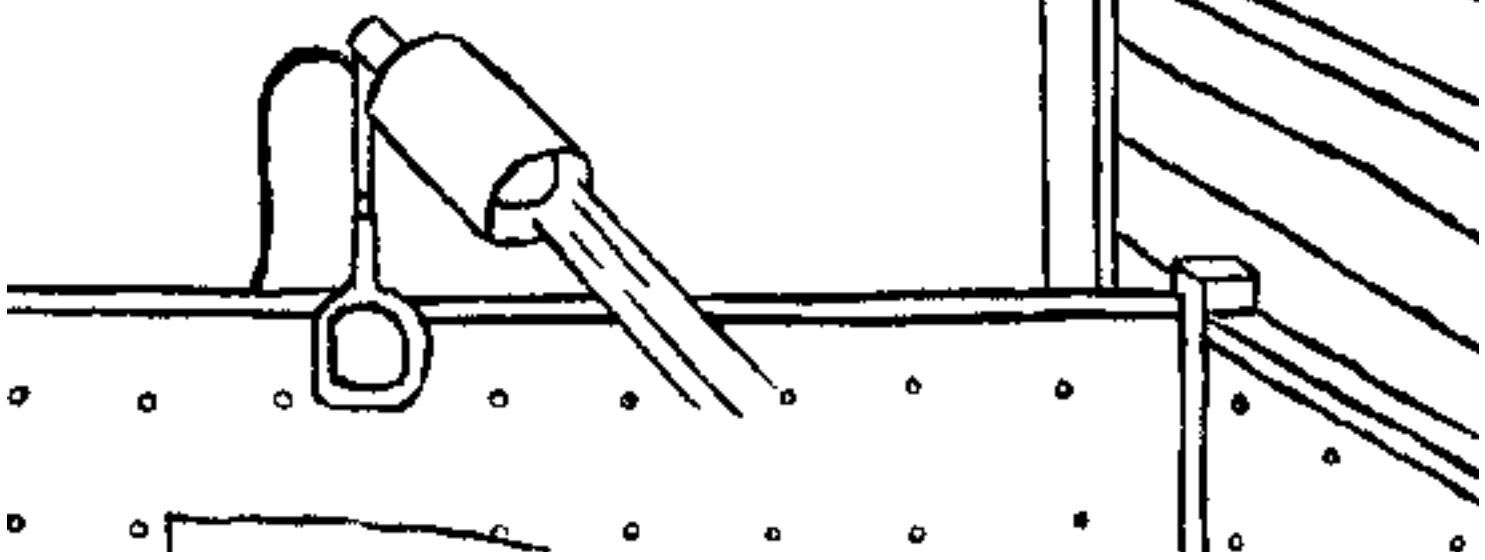


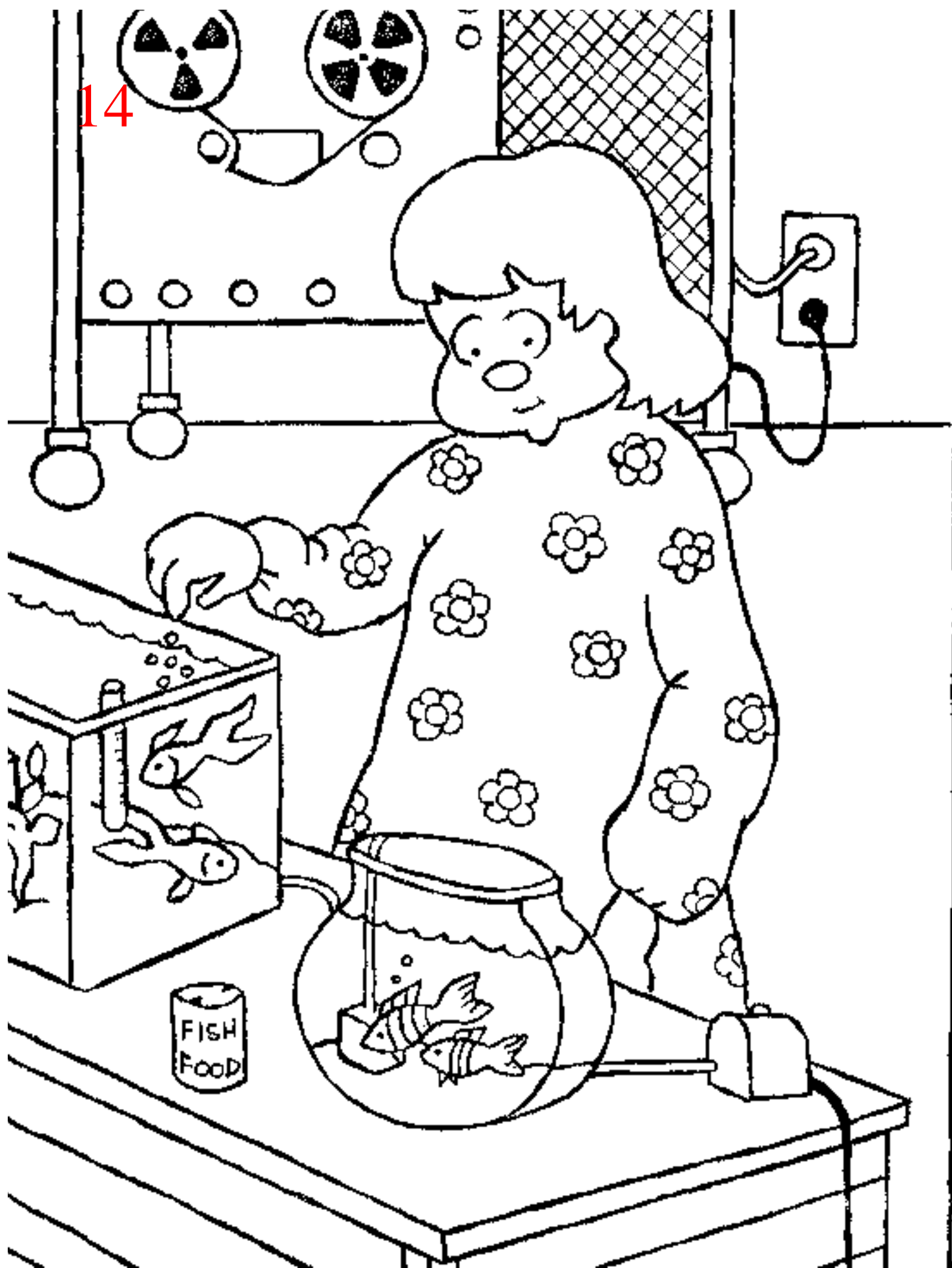
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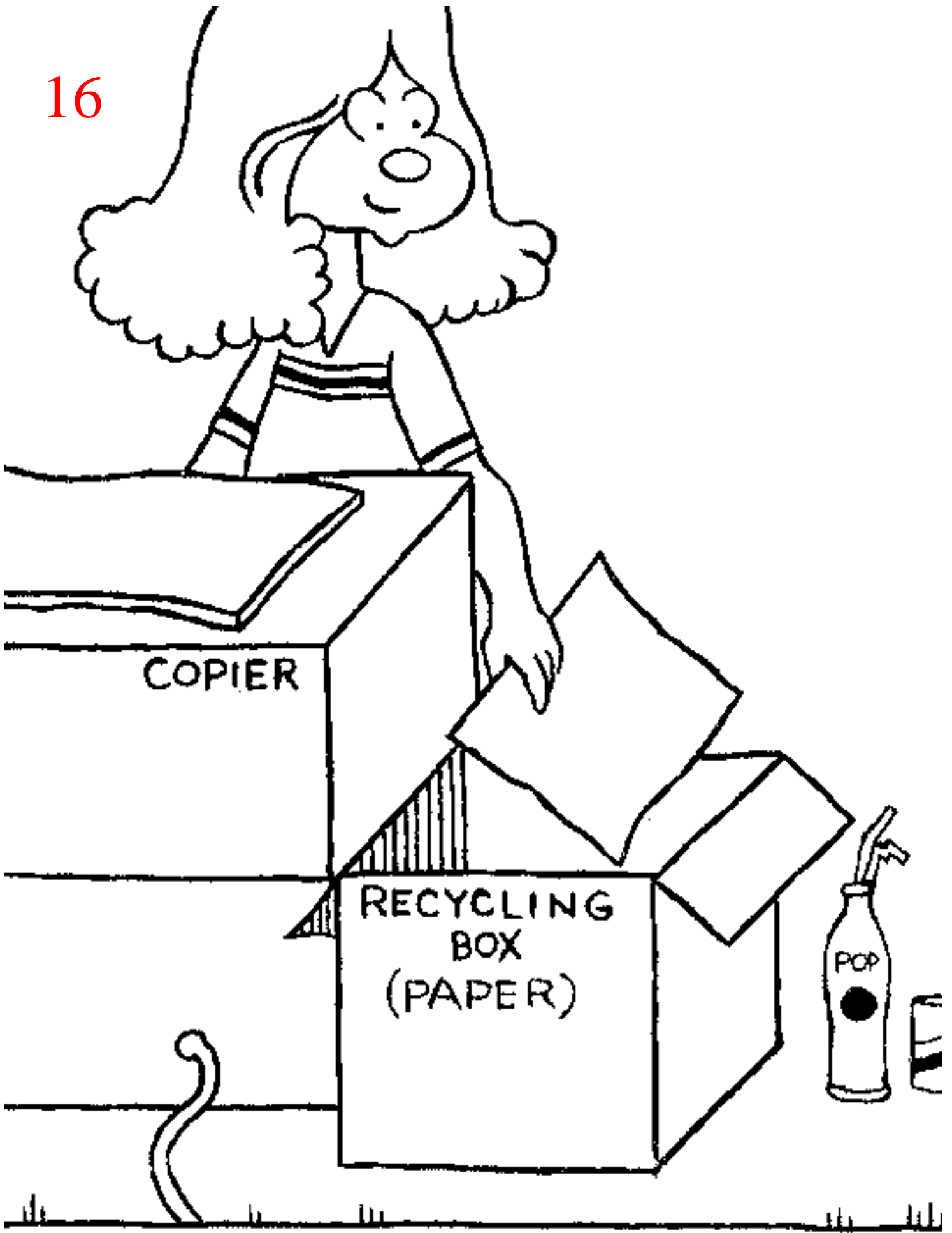


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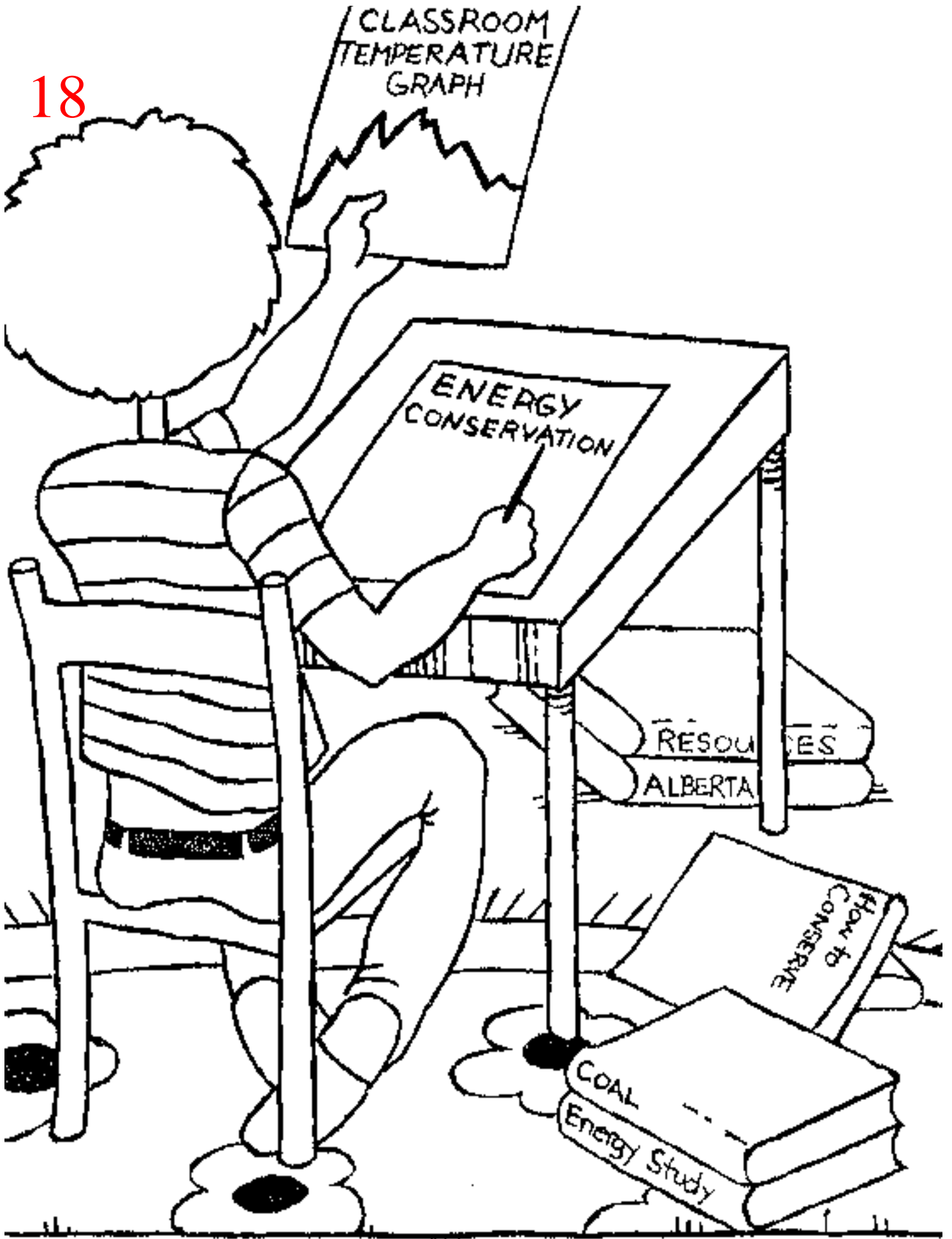




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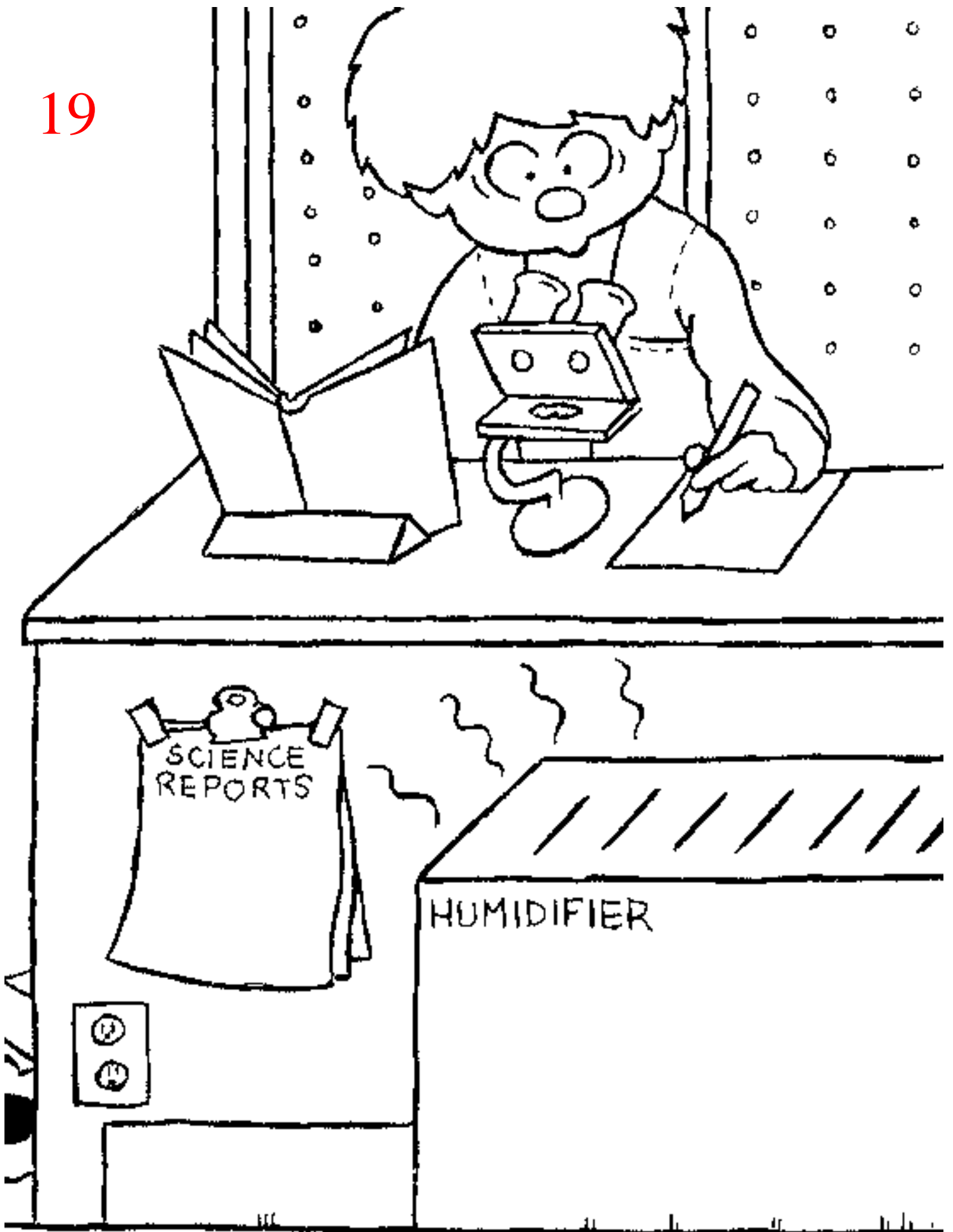
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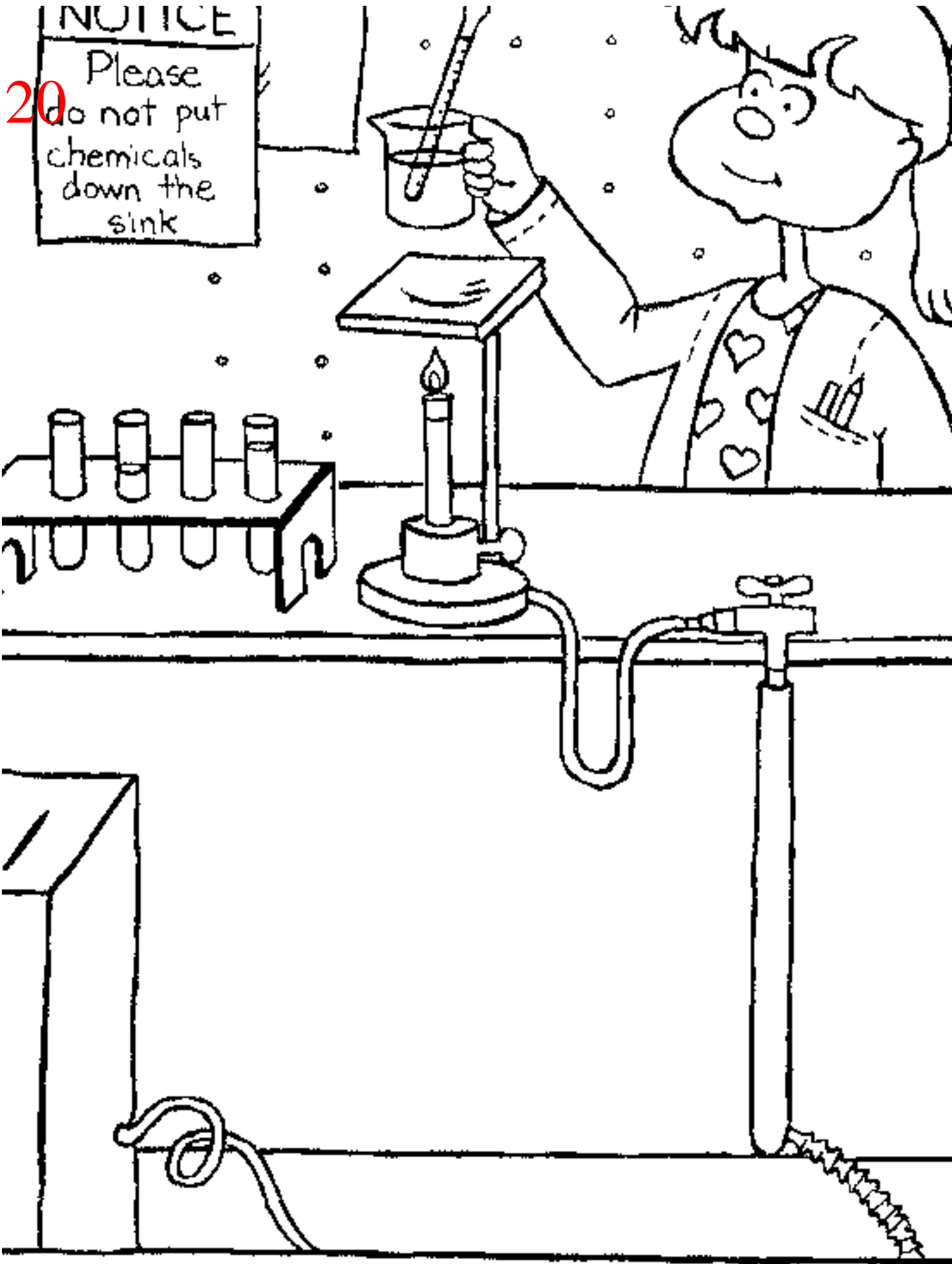
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How to  
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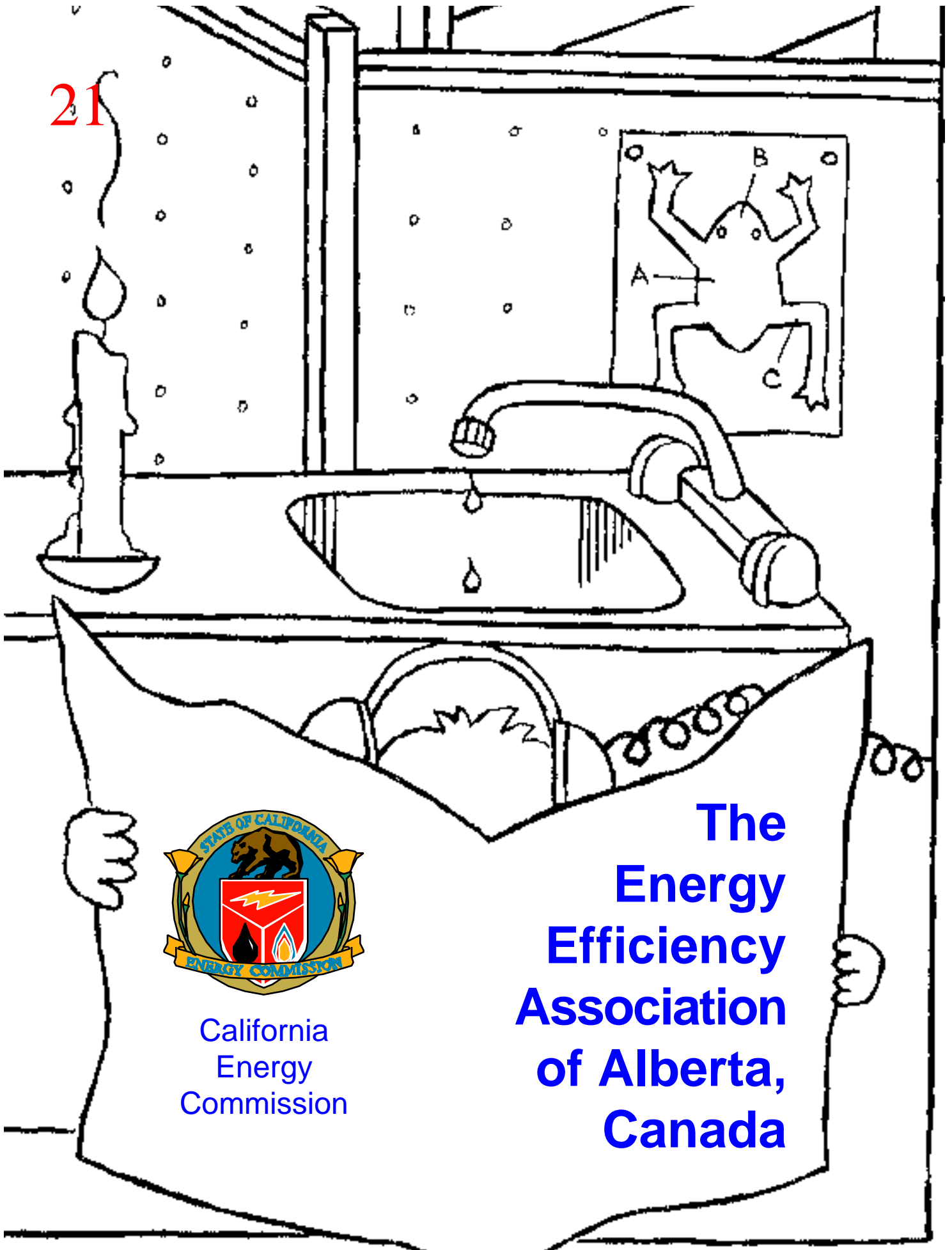
COAL  
Energy Study





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NOTICE  
Please  
do not put  
chemicals  
down the  
sink



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