

Scott Foresman
SCIENCE

Grade 5

**Equipment Kit
Guide**

Unit A
Life Science

Contents

Equipment Kits and Teacher’s Guide	i
---	----------

Activity Notes for Unit A Life Science

Exploring Life Characteristics (A6)	1
Observing Growth of Fungi (A22–A23)	1
Exploring Cells (A38)	2
Investigating the Life Cycle of a Flowering Plant (A48–A49)	2
Investigating Dominant and Recessive Traits (A58–A59)	3
Surveying Inherited Traits (A67–A69)	4
Exploring Protective Coloring (A74)	4
Investigating Eggshells (A88–A89)	5
Investigating Insulation (A96–A97)	5
Exploring Parts of Soil (A108)	6
Investigating Owl Pellets (A116–A117)	6
Experimenting with Carbon Dioxide and Photosynthesis (A135–A137)	7

ISBN: 0-673-59438-6

Copyright © Addison-Wesley Educational Publishers, Inc.
All Rights Reserved. Printed in the United States of America.

Copies of materials in this booklet may be made for educational purposes.

This publication is protected by Copyright and permission for any other use should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise. For information regarding permission, write to: Scott Foresman, 1900 E. Lake Avenue, Glenview, Illinois 60025.

Scott Foresman SCIENCE ® is a registered trademark of Addison-Wesley Educational Publishers, Inc.

2345678910 DH 050403020100

Equipment Kits and Teacher's Guide

Equipment Kit Management

About Your Kits

The equipment in *Scott Foresman Science* is packaged in sturdy plastic bins for your convenience. The quantities included support eight groups of four students each.

Unit Kit/ Grade Level Kit

The Unit Kit contains most of the items you will need to conduct hands-on activities with your students. Equipment for each unit is contained in one or two bins. The Unit Kit is designed to be purchased separately. Each bin is clearly labeled with the grade level, bin number, unit name, and contents. A label inside the lid of each bin references the materials by activity. Only activities requiring kit items are listed.

Unit Kits are also available in a Grade Level Kit configuration. In this format, a common bin eliminates items duplicated across the units for cost savings and convenience.

Demonstration Kit

The Demonstration Kit gives teachers the opportunity to rehearse activities before conducting them in the classroom. Kit-provided materials for each activity are pre-packaged and labeled for easy identification. When used in conjunction with the activity videos, the demonstration kits make it easy to prepare and conduct all investigations and experiments.

Storage of the Kits

Your equipment is packaged in sturdy, translucent plastic bins and labeled for easy storage and access. Bins may be stacked or stored on shelves or carts. Bins are labeled on all sides for quick identification and location of items. This provides convenient organization of materials before and after use.

Replacement Materials

Use the Packing List/Replacement Parts Price List to reorder items as needed for the Unit Kit or Grade Level Kit. These order forms are packed in the plastic bins and can be photocopied. Each list provides a column for entering the quantities of items you need to replace. Materials are organized alphabetically and identified as consumable or nonconsumable.

Complete consumable Replacement Kits are available as well. These kits replenish all the consumable materials for each Unit Kit or Grade Level Kit.

Using the Teacher's Guide

This guide will help you better prepare to conduct the program activities in your classroom. Reviewing the guide while practicing with the activity video and demonstration kit or simply reading the guide upon receiving your classroom kit will make it easy to facilitate an activity with your students.

Getting Started

Familiarize yourself with the kit contents. To make sure your shipment is complete, check the packing statement provided with your kit.

Activity Notes

The Activity Notes in this guide provide comprehensive information to make your activity sessions a success. This information may include:

Video Segment

The video segment number is indicated to help you cue the tape to each Investigate and Experiment activity.

Materials

A materials list for each activity identifies kit-supplied and school-supplied materials. Use this list as a check of your kit contents and as a list for class preparation.

Material Substitutions

For increased flexibility, material substitutions, when appropriate, are indicated.

Advance Prep

These instructions offer preparation guidance as necessary. With these suggestions, you will always be well prepared to conduct activities in your class.

Hints and Tips

Detailed hints and tips help to ensure student success in the classroom. Notes range from how to enhance students' success to increasing your understanding of activity concepts.

Safety Notes

While safety should be practiced at all times for each activity, it may be necessary to consider specific activity concerns. These notes give activity-specific safety tips.

Additional Comments

This section provides extension ideas, alternate activities, and other helpful information.

Exploring Life Characteristics

Explore Activity (A6)

Materials (per group)

Kit Items	School-Supplied Items
plastic graduated cup, 10 oz funnel plastic spoon fine sand sugar 2 balloons (9 in.)	warm water 2 plastic bottles, 16–20 oz paper towel dry yeast clock with a second hand

Advance Prep

Make sure water is warm to the touch, but not hot enough to cause burns.

Safety Note

Have students wipe up any spills immediately.

Additional Comments

If microscopes are available, you may have students observe the yeast cells through microscopes. If magnification is adequate, students should be able to see small buds growing on some yeast cells. These break off the parent cell to become new yeast cells. Students may also look at samples of sand under the microscope. They may observe that the magnified sand particles look like small stones or rocks.

Observing Growth of Fungi

Investigate Activity (A22–A23)

Video Segment 1

Materials (per group)

Kit Items	School-Supplied Items
hand lens	food items: bread, orange peel, tomato masking tape water plastic jar with lid

Advance Prep

- Break up the bread, orange peel, and tomato into pieces about 2.5 cm square.
- Check for student allergies to foods or mold.

Hints and Tips

- Molds grow best in warm, moist conditions.
- Do not use meats or fish; these would produce very bad odors.

Safety Notes

Be aware of allergies to foods or mold. Instruct students not to open the plastic containers. Have students give you their sealed containers at the conclusion of the activity. Properly dispose of all sealed containers.

Additional Comments

Molds grow from tiny spores that may be on airborne dust particles. You may wish to prepare a separate bread mold culture in a flat container such as a sealed petri dish. Students may be able to use hand lenses to observe the spore-producing sporangia at the top of the “fuzz” on the mold.

Exploring Cells

Explore Activity (A38)

Materials (per group)

Kit Items	School-Supplied Items
plastic forceps microscope slide cover slip plastic dropper microscope live coupon, elodea	safety goggles piece of red onion water

Material Substitutions

You can use skin from onions other than red onions to observe cells. In this case, prepare slides for students beforehand. Instead of adding a drop of water before placing the cover slip on each slide, add a drop or two of iodine solution. This will make the parts of the cell easier to see.

Advance Prep

Order live materials at least 2 weeks in advance.

Hints and Tips

- You may wish to have students practice focusing light through the microscope and focusing the microscope using a small piece of newsprint, threads from a cloth, or other small objects.
- If there is difficulty in obtaining a thin layer of cells from the onion, you may wish to use a single-sided razor blade to carefully scrape the thin, red, outer layer of a section of the onion. Try to scrape a single layer of cells from the onion. Students may try observing the edge of the slice where a single layer may be easier to see.
- Students may have to move the slide around on the stage of the microscope to find a clear layer of cells to view.

Safety Note

Remind students not to focus direct sunlight through the microscope.

Investigating the Life Cycle of a Flowering Plant

Investigate Activity (A48–A49)

Video Segment 2

Materials (per group)

Kit Items	School-Supplied Items
plastic cup, 9 oz seed starter mix radish seeds (Rapid Radish™) fertilizer solution paint brush	metric ruler water scissors

Material Substitutions

- Wisconsin Fast Plants™ (rapid cycling *Brassica rapa*, a member of the cabbage and mustard family) are also bred to grow quickly. These are available from biological supply companies.
- You may also use plants grown from bulbs. Bulbs such as amaryllis, narcissus, and lily produce seeds after being pollinated. However, few of the seeds are likely to grow if planted.

Advance Prep

- Use plastic cups, seed starter mix, and Rapid Radish™ seeds to begin growing plants about 2 or 3 weeks prior to conducting the activity.
- Poke drainage holes in the plastic cups. Fill each cup 2/3 full with premoistened seed starter mix (moist, but not dripping). Plant two or three seeds in each cup of seed starter mix, covering seeds with 2 to 3 mm of the mix. Keep the mix moist by placing cups in a tray and adding water as needed. Prepare and add fertilizer according to manufacturer's instructions. After about 10 days, the plants will need to be staked. Students may begin their observations at this point.

Hints and Tips

- Be sure you use Rapid Radish™ plants grown from seeds supplied in the kit. These plants have been developed to complete the life cycle faster than regular radish plants.
- If the seed starter mix is still moist, students can skip watering that day.
- The plants need plenty of light. You may need to supplement regular sunlight with artificial light, such as fluorescent lights, placed several inches from the growing plants.
- Grow several extra plants in case some of the classroom plants do not survive.

Additional Comments

This activity is challenging, but if growing conditions are good, it can be very effective.

Investigating Dominant and Recessive Traits

Investigate Activity (A58–A59)

Video Segment 3

Materials (per group)

Kit Items	School-Supplied Items
3 plastic chips paper cup, 12 oz	masking tape marker

Hints and Tips

- Be sure students understand that uppercase letters represent dominant genes and the lowercase letters represent recessive genes. Review the colors of the offspring with different combinations of genes: RR (red), Rr (red), rr (white). You may wish to post the combinations on the board along with a colored drawing of each of the combinations to serve as a reminder.
- You may wish to compile the data from all groups to increase the reliability of the results.

Surveying Inherited Traits

Experiment Activity (A67–A69)

Video Segment 4

Materials (per group)

Kit Items	School-Supplied Items
grid paper paper	pen or pencil

Hints and Tips

- Show examples of each trait before students begin their surveys.
- Each student in a group may survey several other students and then combine the data. If combining data from all groups, be sure each student in the class is surveyed only once.

Additional Comments

If data from other classes or previous classes are available, you may wish to combine your class data with the others to obtain more reliable results. It would be interesting to compare your class data with compiled data from several classes, or data compiled over several years.

Exploring Protective Coloring

Explore Activity (A74)

Materials (per group)

Kit Items	School-Supplied Items
none	pencil moth template 4 sheets of newspaper 4 sheets of black construction paper scissors

Advance Prep

For each group, cut out a moth shape from cardboard or an index card. This should be used as a template for students to trace their moth shapes onto the construction paper and newspaper.

Hints and Tips

Be sure students turn around completely after picking up each moth.

Investigating Eggshells

Investigate Activity (A88–A89)

Video Segment 5

Materials (per group)

Kit Items	School-Supplied Items
plastic graduated cup, 10 oz white vinegar plastic spoon	safety goggles 4 cleaned eggshell halves textbook paper towel scissors

Advance Prep

- Carefully crack eggs and open them. Remove egg white and yolks from eggs.
- Rinse eggshells and soak them in a solution of bleach (1/4 cup of bleach to 1 gallon of water for about 1/2 hour) to disinfect the eggshells. Allow the shells to dry.
- Carefully trim the eggshells so that the edges are as even and level as possible.

Safety Notes

- Some raw eggs may contain salmonella. Be sure eggshells have been disinfected with bleach solution before beginning the activity. Remind students to wash their hands after handling the eggshells.
- Do not allow students to pile up too many textbooks. Adding four or five textbooks should be enough to demonstrate the strength of the eggshells, even if the shells do not break.

Investigating Insulation

Investigate Activity (A96–A97)

Video Segment 6

Kit Items	School-Supplied Items
plastic spoon 4 plastic bags 4 rubber bands (#33) plastic pail	safety goggles shortening cold water clock with a second hand

Materials (per group)

Advance Prep

Distribute about one cupful of shortening per group.

Hints and Tips

Be sure students have spread the shortening out in the bag so that it covers the students' hands.

Safety Note

Make sure the rubber bands are not too tight around the students' wrists.

Exploring Parts of Soil

Explore Activity (A108)

Materials (per group)

Kit Items	School-Supplied Items
plastic spoon hand lens flat toothpick	garden soil or soil from a vacant lot paper towel

Safety Note

Have students wash their hands after handling soil samples.

Additional Comments

Students may be interested in learning more about the components of soil that affect the growth of plants, such as the levels of nutrients required by plants, and the pH of the soil. Simple garden soil test kits suitable for student-conducted tests are available in hardware stores or plant stores.

Investigating Owl Pellets

Investigate Activity (A116–A117)

Video Segment 7

Materials (per group)

Kit Items	School-Supplied Items
owl pellet hand lens plastic forceps round toothpick	safety goggles paper towel

Hints and Tips

Some students may prefer to wear plastic gloves or plastic sandwich bags when working with the owl pellets.

Safety Notes

Students should be careful when using sharp objects such as forceps and toothpicks. Make sure students wash their hands thoroughly when finished with this activity.

Additional Comments

Possible extensions for owl pellet study include determining food webs, diagramming energy pyramids, and illustrating the impact of pollution (insecticides, herbicides, etc.) in the food web.

Experimenting with Carbon Dioxide and Photosynthesis

Experiment Activity (A135–A137)

Video Segment 8

Materials (per group)

Kit Items	School-Supplied Items
bromothymol blue measuring cup plastic cup with lid, 10 oz plastic dropper live coupon, elodea plastic straw	safety goggles plastic bottle, 20 oz masking tape water marker clock with a second hand

Advance Prep

- Order elodea plants at least 2 weeks in advance.
- Measure water and add to plastic bottles. Each bottle should contain at least 430 mL of water. Add 50 drops of bromothymol blue (BTB) to each bottle. Immediately before beginning the activity, add carbon dioxide to the solution by exhaling through a straw. (The solution should change from blue to greenish-yellow.)

Hints and Tips

- You should be the only person who blows into the BTB solution for each group. This practice will prevent contamination of the straw or the possibility that students will ingest the solution.
- If the sunlight is not bright, the windows are tinted, or fluorescent lights are used, wait 1–2 hours before observing results.

Safety Note

Do not ingest the BTB solution.