HANDS-ON ACTIVITY Partners 1 class period

Catch That Dirt

3D Learning Objective

SEP Obtaining and Evaluating Information

Evaluate the air quality in four different places around the school.

Materials

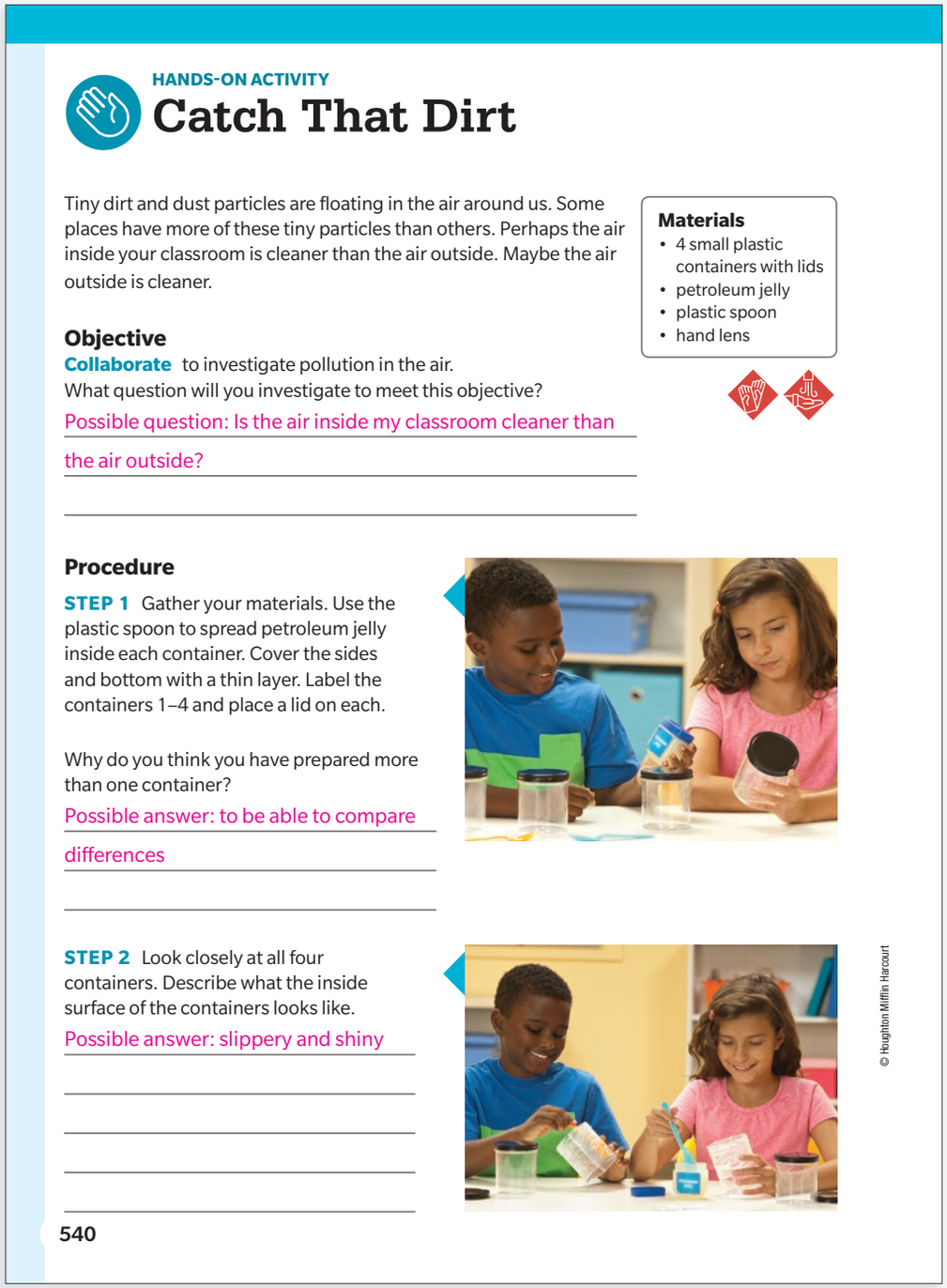
The materials listed in the student edition are a starting point. You may wish to provide gloves so students' hands don't get dirty. You may wish to cover the workspace with newspapers. You may also wish to include permanent markers so students can mark their names on their containers. A microscope may take the place of a hand lens to more closely observe the particles in the air.

Preparation

In order for this activity to run smoothly, have all the supplies ready for each pair of students. Set up containers with lids. Set up petroleum jelly and spoons so students can easily scoop the jelly into the jars. Make sure students know how to use the hand lens.

Procedure

STEP 1 To save time, you may want to give each student a spoon to scoop the petroleum jelly. If using only one spoon, be sure students take turns.



HANDS-ON ACTIVITY

Catch That Dirt

Tiny dirt and dust particles are floating in the air around us. Some places have more of these tiny particles than others. Perhaps the air inside your classroom is cleaner than the air outside. Maybe the air outside is cleaner.

Materials
- 4 small plastic containers with lids
- petroleum jelly
- plastic spoon
- hand lens

Objective

Collaborate to investigate pollution in the air.
What question will you investigate to meet this objective?

Possible question: Is the air inside my classroom cleaner than the air outside?

Procedure

STEP 1 Gather your materials. Use the plastic spoon to spread petroleum jelly inside each container. Cover the sides and bottom with a thin layer. Label the containers 1–4 and place a lid on each.

Why do you think you have prepared more than one container?

Possible answer: to be able to compare differences

STEP 2 Look closely at all four containers. Describe what the inside surface of the containers looks like.

Possible answer: slippery and shiny

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Student Lab Worksheet and complete Teacher Support available online.

STEP 3 Place two containers indoors. Remove the lids.

Place the other two containers outdoors. Remove the lids. Leave the containers in place for two hours. Write the location of each container.

Students should record the location where they placed each container.

STEP 4 After two hours, use a hand lens to study the inside of each container.

Describe what you see on the insides of the containers.

Container 1: Students should observe particles of dirt and dust on the surfaces of the container interiors.

Container 2:

Container 3:

Container 4:

STEP 2 As students work, circulate and assist to be sure they are correctly interpreting the instructions at each station. Make sure they are filling all four containers with an equal amount of petroleum jelly.

STEP 3 Allow students to place their containers without other students knowing where they are. This will help when comparing information at the end of the experiment. Students should record their locations.

CCC Cause and Effect

Remind students that after they check their containers, they will be able to record the dirt and dust particles that are part of the air around them.

Differentiate Instruction

ELL Students learning English may need extra help doing this activity. Pair them with strong English-language speakers who can mime or draw pictures to convey the meaning of what is happening in each step. Have the English-language learner repeat the words to illustrate understanding.

STEP 4 Students may have a hard time waiting the two hours. Be sure to have an activity on hand to fill the time while waiting. Another option would be to complete the activity right before a break time, such as lunch.

Analyze Your Results

STEP 5 Remind students to look at their recordings for Step 4 before answering the questions. Remind them that their observations should be consistent throughout the experiment.

STEP 6 Students should use their hand lenses to get a good picture of what they are seeing. If there are microscopes available, have students observe the particles with them.

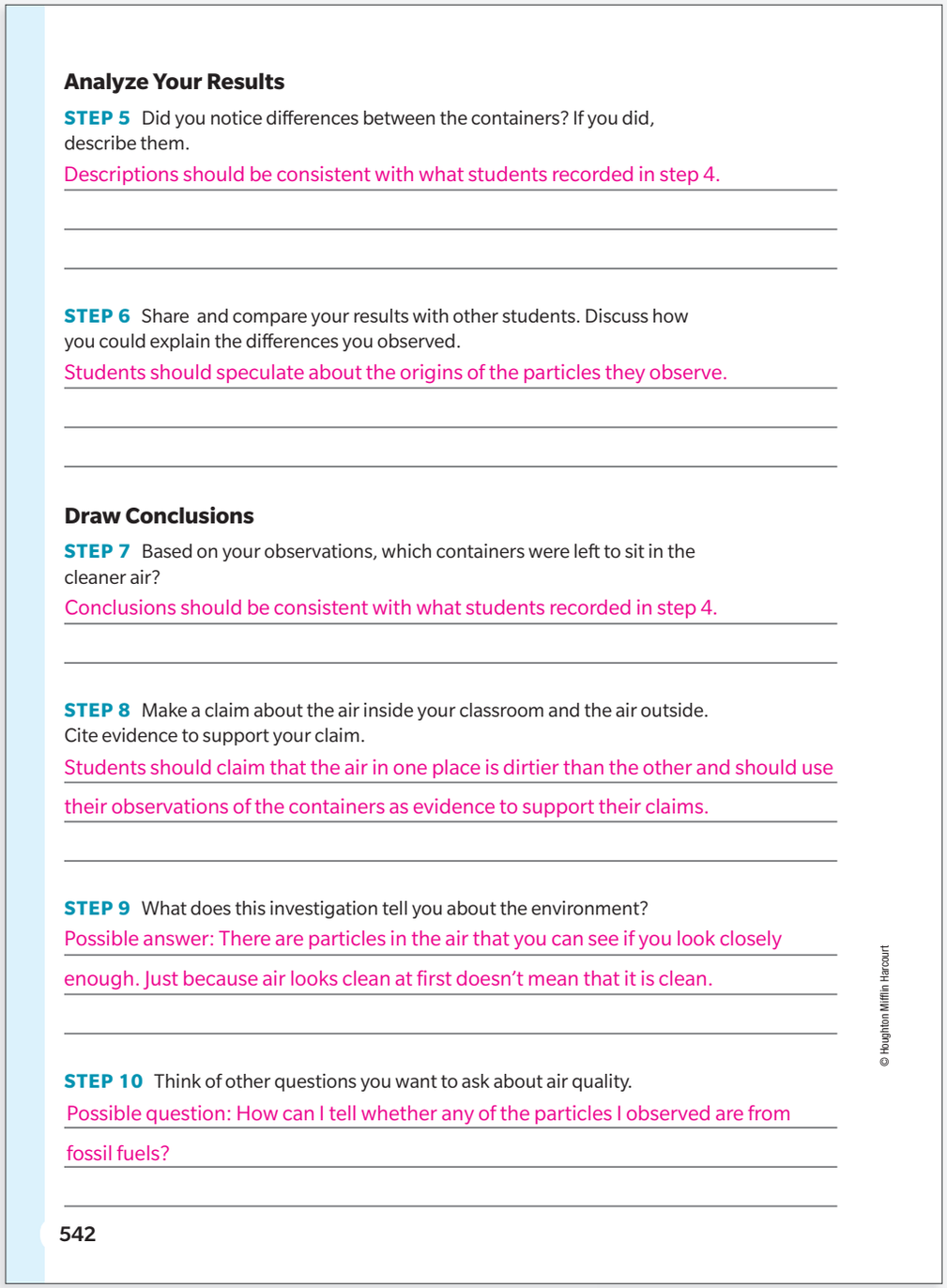
Draw Conclusions

STEPS 7–10 Call on different pairs to share their conclusions. Remind them that their conclusions should be consistent throughout the experiment.

Claims, Evidence, and Reasoning

Have each pair of students from the activity work with another pair to share their ideas about what may be causing the air to be dirty. Be available for any questions or concerns that might arise.

Scoring Rubric for Hands-On Activity	
3	experiment set up correctly, results recorded accurately, analysis and conclusions reflect the results
2	experiment and recording done correctly but analysis and conclusions are inadequate or incomplete, conclusions follow evidence loosely
1	did not fully participate in activity, results recorded but incomplete or unorganized, conclusions are made but do not follow logically from evidence
0	procedure not followed or did not participate, unorganized recording, conclusions have errors or don't exist



Analyze Your Results

STEP 5 Did you notice differences between the containers? If you did, describe them.

Descriptions should be consistent with what students recorded in step 4.

STEP 6 Share and compare your results with other students. Discuss how you could explain the differences you observed.

Students should speculate about the origins of the particles they observe.

Draw Conclusions

STEP 7 Based on your observations, which containers were left to sit in the cleaner air?

Conclusions should be consistent with what students recorded in step 4.

STEP 8 Make a claim about the air inside your classroom and the air outside. Cite evidence to support your claim.

Students should claim that the air in one place is dirtier than the other and should use their observations of the containers as evidence to support their claims.

STEP 9 What does this investigation tell you about the environment?

Possible answer: There are particles in the air that you can see if you look closely enough. Just because air looks clean at first doesn't mean that it is clean.

STEP 10 Think of other questions you want to ask about air quality.

Possible question: How can I tell whether any of the particles I observed are from fossil fuels?

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