Instructional Scenarios for Benchmark 4B (K-2)#3

Instructional Scenario A

The students in Mr. McIlvain's 1st-grade class enjoyed walking around outdoors in the gentle spring rain. They all wore raincoats, hats, and boots. They splashed through five different puddles.

Mr. McIlvain asked them which puddle was deepest. When they said the puddle by the swing set was deepest, Mr. McIlvain asked them how they could be sure. "We could put a stick in each puddle and see how far up on the stick the water comes," suggested Bryan. "The water that comes to the highest place is deepest."

The children did this investigation and found that, indeed, the water in the puddle by the swing set was deeper than the water in any of the other four puddles.

The next day the sun was shining. Mr. McIlvain took his students to get their coats.

"Should we put on boots, too?" he asked.

"No," said several students. "The sun is out today."

When they got outside, Mr. McIlvain took them to the same places where the puddles had been the previous day.

"What change do you notice about the puddles we splashed in yesterday?" he asked.

"The puddles are gone," said Amy.

"Even the deepest puddle is gone," added Bryan.

Instructional Scenario B

Dr. Kay's 1st-grade class set up an aquarium. The children were careful and reliable about feeding the fish when it was their turn.

After three weeks Emily said, "There's not as much water in the aquarium as there was when we started it. I think we should put some more water in it."

"Do you think the amount of water matters to the fish?" asked Dr. Kay.

Two students thought it did not matter. However, almost everyone else said it did matter.

"Because they need enough room to swim around," said Beth, waving her arms in all directions.

Dr. Kay got a pitcher of water that had been standing on a shelf for several days. She gave it to Joan, who was aquarium helper for that day. Joan poured it carefully into the aquarium.

"Do you think we will need to add more water next week?" Dr. Kay asked the class.

Several students agreed that probably more water would be needed.

"How do you know?" asked Dr. Kay.

"Because after a while the water goes down," answered Robert.

"Can anyone support Robert's statement?" asked Dr. Kay.

"I think we'll have to add water next week," said Paolo. "Once I left a glass of water on our back steps for a couple days. When I went back, almost all the water was gone."

"I agree with Paolo and Robert," said Leah. "I noticed that the aquarium water was going down last Friday."

"You are right," said Dr. Kay. "Water disappears from the aquarium."

Instructional Scenario C

One day Ms. Brent asked Ahmed, a student in her 2nd-grade class, to fill a large, translucent container with water. She then gave him a lid and asked him to put the lid on so that the container was covered tightly. Ahmed followed her directions, and she helped him place the container on a table near the pencil sharpener, where it remained.

Two weeks later Ms. Brent gathered the class in front of their aquarium. “What do you notice about the water in this aquarium?” she asked.

Several students commented that there was less water in the aquarium than before.

“That’s right,” said Ms. Brent. “Some of the water has disappeared. But look at the container of water near the pencil sharpener. It is still full, even though it has been there for two weeks. Why do you suppose that is true?”

Several students responded that the container was closed tightly with a lid, but there was no lid on the aquarium.

“Are you suggesting that water disappears from containers that are open to the air but stays in closed containers?” asked Ms. Brent.

The students thought about this for a time.

“How could you prove that water disappears from open containers but stays in closed containers?” Ms. Brent asked. “Turn to a partner and discuss this problem,” she directed.

Several pairs suggested an experiment. Ms. Brent let the students devise and carry out their own experiments. Soon open and closed containers of water, carefully labeled with student initials and dates, lined the shelves of the classroom.

After a week students compared their results. Alberta had bumped into her containers on the third day and spilled them. Al and Lorena had used only open containers, so they could not make any conclusions about closed containers. But in all the other cases the students found that water in open containers disappeared, while water in closed containers did not.

Instructional Scenario D

In Mrs. Giossi's kindergarten the students were finger-painting. Admiring their work, Mrs. Giossi took each painting and clipped it on a line that extended across the room.

The next day she directed the students' attention to the pictures. "How are the paintings different from yesterday?" she asked. When students said that the pictures were now dry, Mrs. Giossi commented, "Yes. The water seems to have disappeared."