

Rubric

Performance Statement: The student will explain the structures of an organism and relate their functions; communicate their thinking by drawing, labeling, and explaining; and plan and carry out their observation.

Scoring:

| DIMENSION | 3 = TARGET | 2 = ACCEPTABLE | 1 = DEVELOPING | 0 = NO RESPONSE |
|---|--|---|---|---|
| Criteria 1 LS1A – Structure and Function | - Accurately explains how the structure helps the organism survive, grow, or reproduce | - Explains how the structure helps the organism survive, grow, or reproduce | - Inaccurately explains how the structure helps the organism survive, grow, or reproduce | No evidence of relating structure and function. |
| Criteria 2 S&EP 2 – Developing and Using Models | - Draws a picture of the structure as observed with finer details. - Labels structures accurately using scientific terms | - Draws a picture of the structure as observed with obvious details - Labels structures | - Does not draw a picture of the structure as observed; draws a cartoon-like image. - Unclear labeling | No evidence of drawing or labeling |
| Criteria 3 S&EP 3 – Planning and Carrying Out Investigations | - Selects an organism and a structure to observe - Selects a tool and magnification to enhance observation - Uses digital microscope appropriately; focuses to create a clear, sharp image | - Selects an organism and a structure to observe - Selects a tool and magnification to enhance observation - Uses digital microscope appropriately but requires guidance to create a clear, sharp image | - Selects an organism and a structure to observe - Selects a tool and magnification to enhance observation - Unable to use a digital microscope appropriately | No evidence of planning or carrying out the observation |

Digital Microscope Activities

Explore different features of the handheld digital microscope. Begin by capturing still images of flat objects. As you learn to focus and adjust the light for clear, sharp images, capture solid, irregular-shaped objects and live organisms. Next, try measuring small objects, comparing images side-by-side, and capturing video and time-lapse images. Create rubrics to assess students' ability to use this digital tool and dimensions from the K–12 science education framework and *Common Core State Standards*.

Capturing Still Images

Use the digital microscope to observe tiny ridges and valleys on the tips of your fingers. Check for whorl, loop, arch and other patterns. Notice shiny droplets coming from sweat glands in your finger. Then, observe and capture images of a penny and a \$5 bill. Notice Lincoln sitting inside the Memorial on the tails side of the penny and anti-counterfeiting features such as watermarks, color shifting ink, and micro-printing on the \$5 bill.

Comparing Side-by-Side

Use the side-by-side feature to observe and compare captured images of salt, sugar, and flour. Sprinkle some sugar, salt, and flour on card stock slides, capture images of each type of crystal (see image below) and use the side-by-side feature. Compare the properties and visually organize your thinking in a Venn diagram. Use students' work to assess their abilities to observe, describe, and compare properties.

Measuring

Use the measuring feature to compute distance, surface area, and angles of small objects. Measure and compare the width of salt and sugar crystals or different strings. Measure the surface area of two different coins.

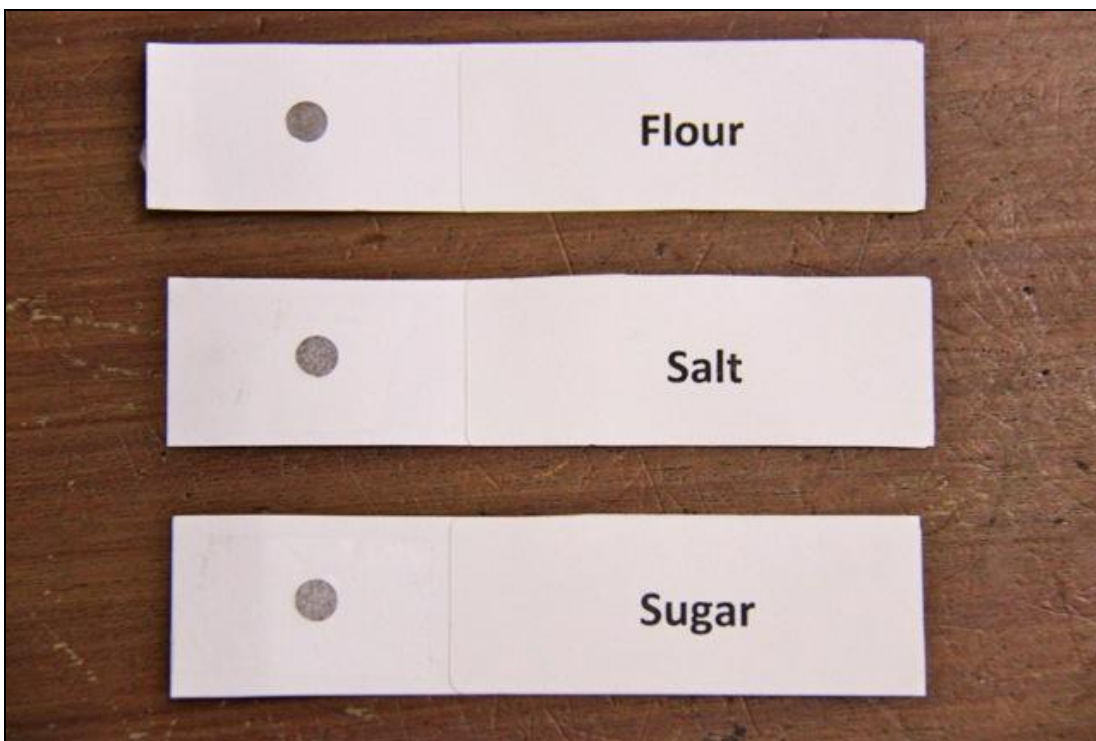
Capturing Video Images

Use the video feature to capture images and play back of capillary action. Draw a thick one-inch line on a white paper towel with a black, water-soluble marker. Place the digital microscope in the stand and focus on the line and surrounding paper towel. Use the video feature to record the movement of water through the black ink and observe the separation of the pigments. When playing back the brief video, students can explain what they observe. Assess their ability to explain capillary action.

Capturing Time Lapse Images

Use the time-lapse feature to capture, compress, and play back longer events in nature, such as a caterpillar eating a leaf, an adult butterfly emerging from a chrysalis, a decaying piece of apple, or an ice cube melting on a plate. When playing back the brief video, students can explain the physical or biological changes. Assess their ability to use science vocabulary and to explain the changes.

Cardstock Slides and Digital Image of Salt



To construct card stock slides, cut 1-inch \times 2-inch cardstock, punch a hole, apply transparent tape, and sprinkle material over the hole, on top of the sticky side.