

UNIT 1 - BODY PLAN AND ORGANIZATION

ACTIVITY – Gel Person

Students will use a gel person to:

1. describe the overall body plan the human body
2. identify the major organs of the human body
3. understand the visualization of scanning imagery
4. describe anatomical planes and directions
5. make transverse sections

Materials Needed:

Gel Person

unflavored gelatin (.25 Oz. Envelopes)
blue food coloring (optional)
gel person mold (gingerbread man)
pasta (assorted shapes & sizes, cooked)
vegetables (beans, cauliflower, cooked)
tray or plate
*materials will make two GEL Persons

Scanning Imagery

gel person
plastic or glass plate
ring stand or bracket (optional)
flashlight
white card (8.5" x 11")

TRANSVERSE SECTION

gel person
plastic knife
index cards (4" x 6")
pencil
ruler (15-30 cm, marked in cm)
paper towels and disposal bag

Strategy:

MAKING A GEL PERSON

1. Obtain two gelatin molds in the form of a person. (May substitute a Teddy Bear Mold)
2. Mix two envelopes of unflavored gelatin into 1.25 cups of boiling water until dissolved. Add one drop of food coloring. This will give some contrast to the "organs" inside the gel person without losing too much transparency.
3. Pour enough of the warm gelatin solution into the bottom of the mold to just cover the bottom (anterior surface of the person). Place in a refrigerator until set (about 30 minutes). Set aside the remaining gelatin solution until Step #5.

4. Place pasta and vegetables in the mold on top of the gel.
Use a floret of cooked cauliflower in the head for the brain.
In the rest of the body, use any or all of these:
 - several pieces of cooked small elbow macaroni for hollow organs.
 - one piece of cooked rigati for a large hollow organ with an irregular surface.
 - 2 or 3 canned red beans for solid organs such as the kidneys.
 - one short strand of cooked vermicelli for solid fiber-like organs such as nerves.You might want to coil a piece of this to show how coiled organs show up in a transverse section.
 - *Use other materials in addition to those listed.
 - *Do not use too many items. Spread things out a little. You can also put "muscles" in the arms and legs as well as the middle part of the body. Note: Do not use candy as the sugar is dissolved by the gelatin.
5. Fill mold to the top with the remaining gelatin solution. Refrigerate until solid (about 30 minutes).
6. Remove mold from refrigerator and dip in hot water for a few seconds to loosen gelatin. Place a tray or plate over the mold and invert, dropping gelatin form onto tray. Use the gel person as soon as possible. Keep refrigerated until used.

SCANNING IMAGERY

1. Place one gel person on a glass plate.
2. Clamp the plate with the gel person on it to the ring stand. Instead of using a clamp and ring stand, or a volunteer hold the plate steady.
3. Use a flashlight to cast a shadow on the white card. Do this by holding the light source above the gel person and the white card below the transparent plate. This demonstrates the principle of standard X-ray photography.
4. Holding the light source in one hand and the white card in the other, rotate the pair around the gel person without changing the distance or angle of your hands. This creates the action of an axial scanner used in creating CT scans.
5. Discuss how a scanned image can produce a 3D image of the contents of the body or of an individual organ.

MAKING TRANSVERSE SECTIONS

1. Lay one index card in front of you so the long side is along the left and right and the short side is at the top and bottom. Use a metric ruler and pencil to mark off one index card into 1cm segments. Start at the top by making a line 1cm from the top and proceed down the card. Number each segment by writing a number along the left edge of the card with your pencil.
2. Place a gel person on the index card that you have just marked off into 1cm sections. It should just fit on the card if the lines are along transverse or horizontal planes of the gel "body".
3. Using a new index card, mark off 1cm lines as you did in Step #1. Now sketch the outline of the gel person on this second card exactly matching the way it lies on the first card. Then sketch in the structures or "organs" you see inside the gel person. Keep the sketch simple but accurate.

4. Beginning at the top of the gel person's head, use a plastic knife to cut a transverse section along the first line on the underlying card. That is, cut a transverse section 1cm from the top of the head. Place this section, inferior side up on a clean index card. Mark the number of the section (#1) along the left edge of this clean card.
5. Continue to cut sections in order: at the 2cm mark, at the 3cm mark, and so on, until the gel person's body is completely sectioned after marking each section lay it on a clean index cards. Three or four sections should fit on each card. Do not forget to mark the number of each section along the left edge of the clean card as you lay them down.
6. Make a sketch of each section on index cards.
7. Discard used material in the garbage bag.

Assessment:

At the completion of this lesson students will accomplish the following:

1. Describe anatomical position.
2. Identify the major organs of the human body.
3. Locate and describe anatomical planes and directions.
4. Describe the relationship between your original sketch, the one made before the gel person was cut into segments, the sketches of the transverse sections.
5. Explain how this "transverse sectional anatomy" improved your understanding of how the gel person is structured.
6. Explain how this dissection relates to scanning medical images that might be made of your gel person.

Conclusion:

This activity aids students in understanding and visualizing the mechanics of scanning imaging as a diagnostic technique.