

Brandon Estroff

Project Focus

Best Lesson

Grade Level: 7th

Title of Lesson: A Marble Ride through the Digestive System

Unit Title: Body Systems

Performance Standards Covered: S7L2

Students will describe the structure and function of cells, tissues, organs, and organ systems.

e. Explain the purpose of the major organ systems in the human body (i.e., digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease).

S7CS5

Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.

b. Understand that different models (such as physical replicas, pictures, and analogies) can be used to represent the same thing.

Essential Question: What are the organs and functions of the digestive system?

Objective: Students will have a very solid understanding of the digestive system, in particular the pathway of the system.

Key Words and Terms:

Digestive System: The system that turns food into energy your body needs to survive.

Esophagus: Tube from the throat to the stomach.

Stomach: Holds food, while also secreting acid to break down the food.

Small Intestine: Breaks down food further, using enzymes and bile from the Pancreas and Liver. It also absorbs nutrients from the food.

Large Intestine: Absorbs water and break down wastes to extract small amount of nutrients.

Abstract: This is an active lesson that involves the participation of all students as they work in teams to make a life size digestive system model on posters. The students will then create a track that a marble can go through that will replicate the path of digested food through the system.

Materials Needed: 7 cardstock sentence strips per group (groups of four is recommended), 1 marble per group (a few extra is recommended just in case a few get lost), 1 poster board per group, 1 cup per group, 1 roll of duct or masking tape per group, 5 cotton balls per group, 1 pair of scissors per group, 1 box of markers per group.

Safety Concerns: Poorly behaved students may throw the marbles and if another student were to be hit by the thrown marble it would hurt. Also students with scissors are always a safety concern.

Procedure:

- 1) Teach the students about the pathway of the digestive system. It would be helpful to open a picture of the system on the internet and point out where

each organ is. Next you should teach them the role of each organ if they break down food or absorb nutrients. Before you start the activity, it could be helpful to show a video of the digestive system in action (This is a good video to show if you choose to show one:

<https://www.youtube.com/watch?v=eTMz11cblZc>)

- 2) Divide the class into groups, I recommend putting 4 students in each group, give each group the materials that I listed above.
- 3) Instruct the kids that part 1 of the activity is to draw the life size digestive system. If the students need help to remember what it looks like, you may want to pull up a picture on the board or you can allow them to look in their textbooks.
- 4) Once they draw the system with all of the organs, the next step is to label the organs, they can do this by either making arrows or by numbering each organ and writing the organ that correlates with the number on a separate sheet of paper. Next to the labels you will ask them to give a brief description of the function of that organ.
- 5) After they have drawn and labeled the organs, you will instruct them to map out their plan for their marble track. Be sure to stress that they want to keep it as similar to the track of food as possible, but also make sure they know if the marble goes straight down through the system it will not stay on the track, they should zig zag the track so the marble doesn't fly out of control. You may want to consider making an example track before you come to class so they understand what they are trying to make.

- 6) When they finish mapping out the plan for the marble, you can go ahead and show them some tactics of how to fold the sentence strips in order to make the track. The best tactics are folding it “hot dog” (be sure to make a firm crease in the middle). Another way to fold the sentence strips is a “tube formation”, in which you fold two strips the “hot dog” way and tape them together forming a tube (this tactic may be best to represent the esophagus). After they have some practice folding the sentence strips let them start cutting the strips so they can fit their poster, then they can tape the strips to their poster. Also be sure that there is a cup taped at the “anus” of the poster in order to catch the marble at the end of the run.
- 7) Once the track is taped onto the poster board it is time to have some test runs. Most likely the marble won’t stay on the track after the first run, but that is why you have cotton balls. The cotton balls are there to serve as bumpers for the marble, tape the cotton balls on the poster board in locations that will help keep the marble on the track.
- 8) After all the students make tracks which the marble won’t fly off of, each group will present their digestive system marble run to the class.

Notes and Tips: Bringing an example that I made at home to the class, helped a ton, this gave the students a reference point and they had an idea of how to make their track actually work. Another tip is to go around and watch as they draw their digestive system, make sure they are actually making it life size and not really small, because if it is too small the track won’t be able to fit. Also you will most likely have to help them make adjustments during their trial runs, sometimes the students

couldn't figure out where the problem was so you may need to suggest to them what they should fix. One more tip, if I did this lesson again I would spread it out over two days, it is hard to do it all in an hour, towards the end many groups ran out of time and probably only half the groups actually finished their marble runs.

References: My mom is a teacher and she always does a marble drop to demonstrate friction, so she sent me her lesson plan and I adjusted it to work by going through the digestive system.