# What's My Purpose in This Life?

## Intro to Cell Theory: Organelles

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| **Grade Level** | 6th – 10th Grade | **Time Frame** | 3-4 class period(s) |
| **Subject** | Science | **Duration** | 145 minutes |
| **Course** | Biology I | | |

## Essential Question

Why are organelles important to cells? Why are cells called “the building blocks of life”?

## Summary

In this lesson, students will be introduced to cell organelles, their functions and cell theory. They begin by watching 2 videos and making analogies between them. Then, student groups will make an assembly line. They will use an H-Chart to compare and contrast their assembly line to that of organelles. Students will create a cell flip book and participate in a game of Kick Me.

## Snapshot

**Engage**

Students will watch two short videos and discuss analogies between them.

**Explore**

Student groups will make their own Hershey’s Kisses to simulate an assembly line.

**Explain**

Students will learn about organelles, their functions and reflect using an H-Chart.

**Extend**

Students will make an organelle flipbook.

**Evaluate**

Students will play Kick Me about organelles and their functions.

## Standards

*Next Generation Science Standards (Grades 6, 7, 8)*

**MS-LS1-2:** Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.

*Oklahoma Academic Standards (6th Grade)*

**PS4:** Waves and Their Applications in Technologies for Information Transfer

## Attachments

- H-Chart-Template - Spanish.docx
- H-Chart-Template - Spanish.pdf
- H-Chart-Template.docx
- H-Chart-Template.pdf
- Kick-Me-Print-out.docx
- Kick-Me-Print-out.pdf
- Lesson-Slides-What-s-My-Purpose-in-This-Life.pdf

## Materials

- Technology that allows PowerPoints to be displayed
- Marbles ~ 10/15/student group
- Aluminum foil
- Ribbon, string or yarn
- Scissors and rulers
- Copy of H-chart
- Transparency paper (or paper protectors work just as well)
- Multi-colored Sharpies or other permanent markers
- Copy of Kick Me print out - enough for a class set
- Index cards, or sticky notes,for Kick Me activity (if you are handwriting them instead)
- Stapler
- Timing device

# Engage

15 MINUTES

Go to slide 5 and show the students video 1: Introduction to cells . Next show them video 2: How It's Made-frozen pizza. Then, lead a discussion on what was happening and the significance of each step in the process. Save the discussion of the intro to cells video until slide 6.

Go to slide 6 and lead a discussion using the 3 prompts listed. Possible student answers might be: 1. It followed a certain order or one step led to the next step happening. 2. Changing a tire, building a house, fingernail paining, following a recipe. 3. Hopefully student will realize the analogy between the two videos. Organelles have specific jobs to do just like the jobs show in the pizza making video.

### Keep The Talking Short

This could be a fun time to let the students speculate and create some fun and wild situations. But keep an eye on time. In fact, setting a timer is a great way to make sure this portion doesn't go any longer than 10 minutes for the videos and another 5 minutes of discussion.

# Explore

23-30 MINUTES

Separate students into groups of 3 to 5. Go to slide 7 and tell them their group's goal is to make as many 'Hershey Kisses' as possible in 5 minutes. Either hand out, or allow them to, gather the materials needed. Then allow groups about two minutes to test and trouble-shoot before timing. Circulate around the room to make sure students are staying on task. After the five minutes is over, have students talk about how it went, including challenges/barriers and successes.

### Is Context Needed?

The purpose of this activity is to get the students in the mindset of the assembly, and each participant has a role, like the organelles in the cell.

### Classroom Management Tip

You may want to decide in advance how to "set up and run" their group assembly line. Options: 1. Let students figure it out on their own. 2. Tell them it's an assembly line but let them determine the different tasks for each group member. 3. You assign the roles/tasks to the group members. Possible tasks might include: marble grabber, foil cutter, ribbon cutter, ribbon placer, foil wrapper and ribbon tier.For smaller groups, some tasks can be combined. :

### Make It A Competition?

You may want to be the 'judge' and decide which group did the best job of making the most and best kisses. If you brought real Hershey's Kisses you could award those to the winning team.

# Explain

30 MINUTES

Go to slide 8 and hand out an H-Chart to each student. On the left-hand side they should write a reflection of their experience during the construction of the kisses activity. H-Charts are similar to a Venn Diagram and are used to compare and contrast two items.

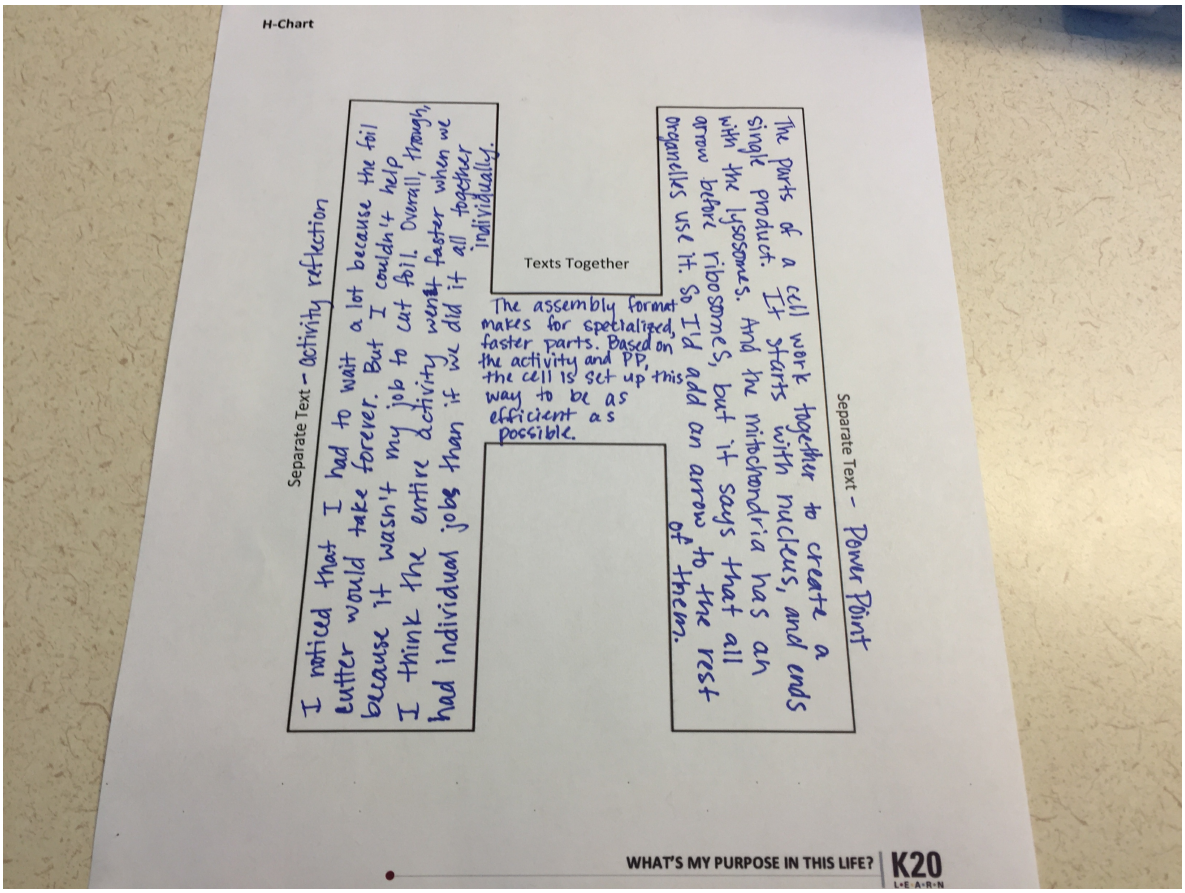
### Provide Inspiration

When left with an open prompt of 'reflect', most of the time students will talk about how they felt it went or whether they had fun or not. Even though those reflections have value, they don't for this lesson. What we're looking for are reflections that connect to the purposes of organelles. Things like efficiency (or lack of) that the students perceived, or how being organized and forming a team where members had a specialized task helped them succeed. Try not to give away what specifically should be written, but cajole them away from the emotional reflection and towards the analysis reflection.

Then, display the PowerPoint slide of the different organelles. Have students write what they notice from the slide. When they're done, have them compare the two reflections, and write a small paragraph over what the students have learned from both reflections.

### How To Make An H-Chart Work

Each of the two texts gets a separate reflection. The first one is usually easier, but in the second one students will usually already try to synthesize them together if they're similar. So add in directions that explicitly say that the second text needs to be analyzed as if the first one doesn't exist. Then, when both are analyzed separately, combine the thought ideas in the middle. The best H-chart syntheses included ideas that weren't talked about in either of the individual reflections, but tie them together.

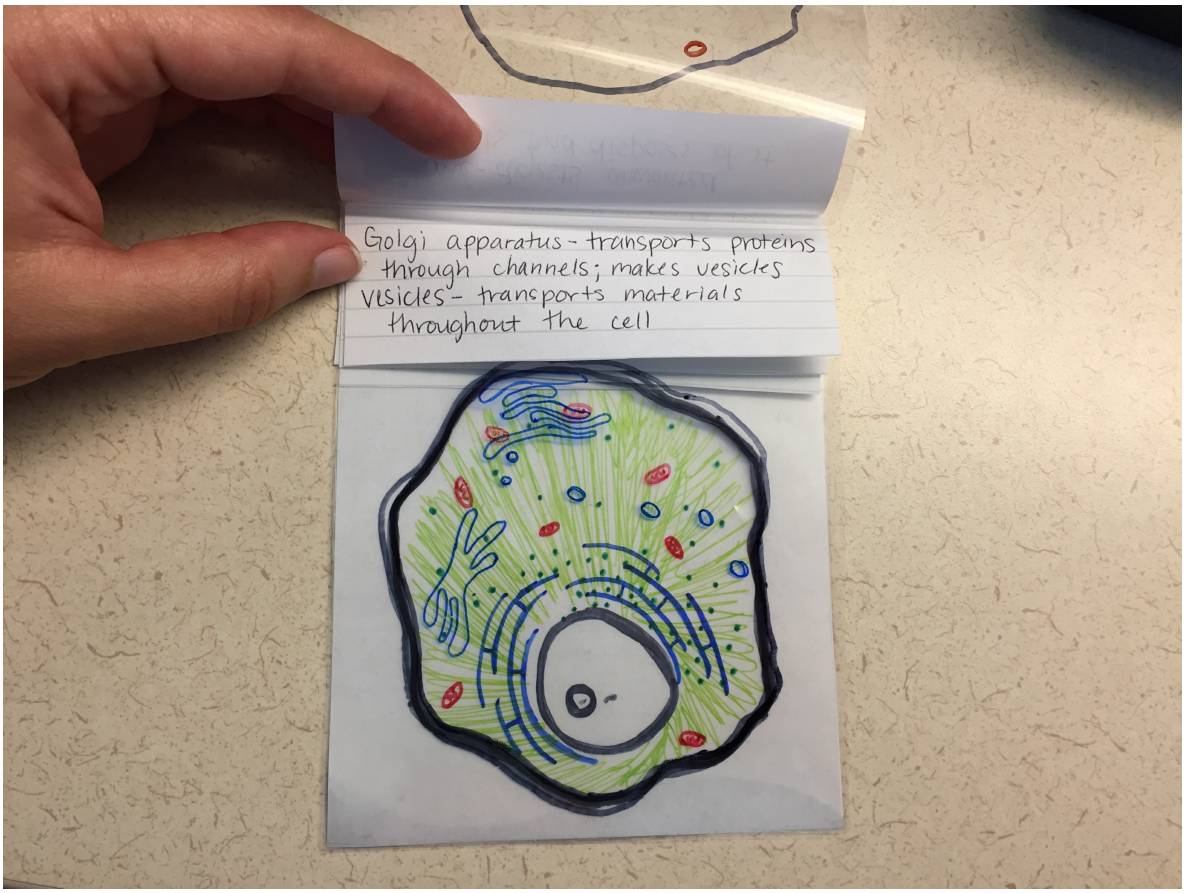



*An example of a completed H-chart. As you can see, it doesn't have to be really profound, or perfect, but it combines the ideas of both sources successfully.*

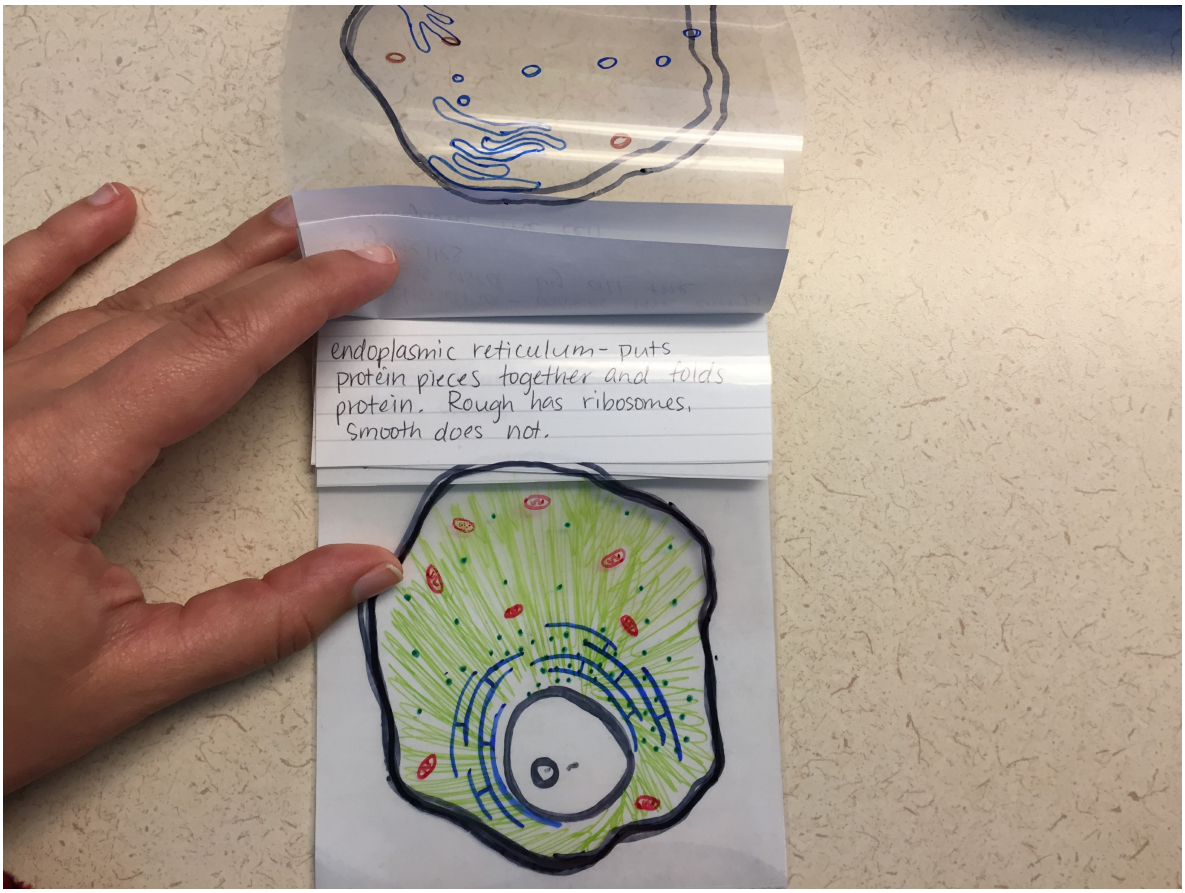
# Extend

Have all the materials out for students to make their flipbooks. Having them start with the nucleus, have each clear page be a different organelle or group of organelles (if they serve a similar process). Have students use the information on the PowerPoint and in their textbooks to make the word portion of the flipbook, but allow them the creativity of deciding what will go on each page.


*What the sample flipbook looks like with all the layers on top of each other*




*An example of how two organelles are on the same clear sheet, since they have similar purposes*




*This is to show how each layer adds detail. In this photo it's easy to see the last two layers (at the top of the photo) to be able to visualize how the flipbook pieces are made and layered to make the full product.*

# Evaluate

**Before Class Starts**

You will need to print off sticky labels for the Kick Me activity, or you can write words/definitions on a post-it note. The attached file works for Avery 5160/8160 address labels. Paper and tape works in a pinch, though.

Students will be participating in an instructional strategy called Kick Me. Place a term or definition on each student's back. Their task is to find out what term they have on their back by asking other students questions in the class. Let the students mingle for about 5 minutes, then, as a class, have each student say what term they think they have on their back. It is important that other students in the class DO NOT tell the student what is on their back, it is up to them to collect information from other students and make a determination based on that. This can be done just once, or in several rounds.

Sample interaction would look like this:

- Student A: "Student B, your term is the command center for the cell"
- Student B: "Student A, your term looked like a bean-shaped thing with folds in our flip book. It makes energy."
- During the class discussion, Student A should guess " mitochondria" and Student B should guess "nucleus."

**Spoilers!**

Don't allow questions like, "Does mine say nucleus?" because that'll just give it away. Allow some creativity in the questions without being too blatant.

## Resources


- Website that inspired the Extend activity Yglesias, Debbie, Schoen, D and Bonner, M. "The Function of Cell Organelles". (n.d.). CPALMS retrieved from http://www.cpalms.org/Public/PreviewResourceUpload/Preview/38327
- YouTube video (Engage): Foodgalaxy. "Production of Frozen Pizza". (2011, Jan 4) YouTube channel. Retrieved from https://www.youtube.com/watch?v=Q2OWpAJxMos
- Website that inspired the Explore activity. Petlak, Lindsey. "Assembly Line Simulations". (2016, Jan 28) Scholastic. retrieved from http://www.scholastic.com/teachers/top-teaching/2016/01/assembly-line-simulations
- Kick Me (Evaluate): K20 Center. (n.d.). Kick me. K20 Learn. Retrieved from https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f505b77c
- H-Chart (Explain): K20 Center. (n.d.). H-Chart. K20 Learn. Retrieved from https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f5060ba6