

Grade 10 Science

Biology: Cell Parts Terminology

# **MATCHING CELLS WITH SCRATCH**

# Meet Scratch

Scratch is a coding platform for all ages and subjects. Students can use Scratch to learn 21st century skills while coding their own interactive stories, animations, and games.



# Cell Terminology Matching Game

Today we will be coding a matching game to practice learning the cells parts and their functions. Check out an example of what the game will look like by following this link!



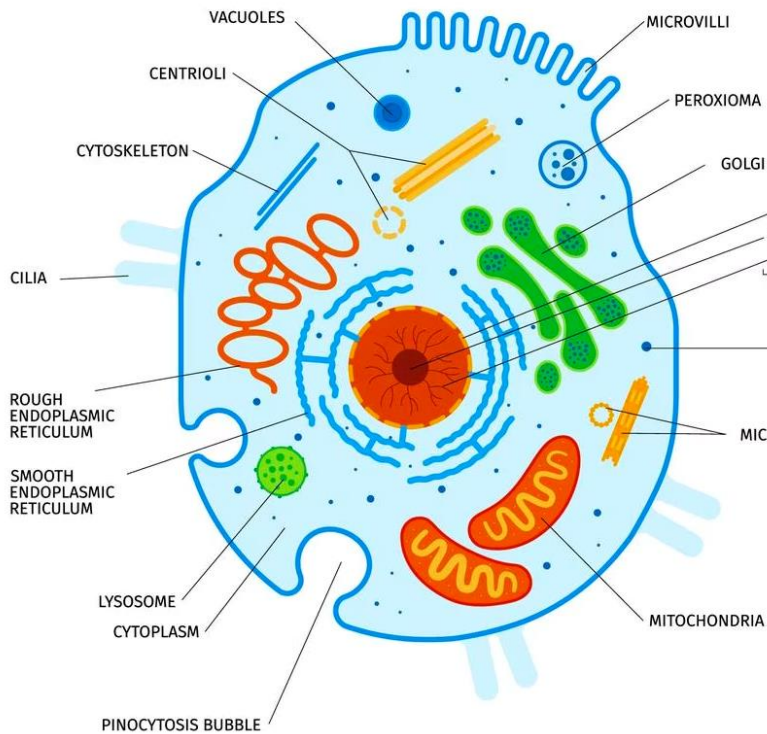
# Background Knowledge

To finish this activity you will need to know

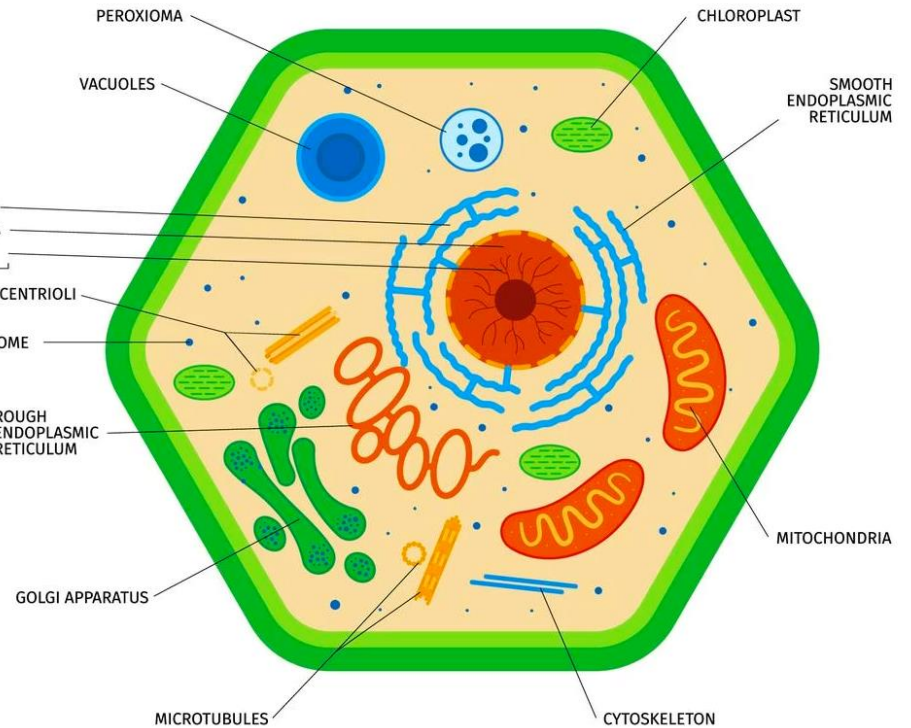
- How to navigate Scratch
  - See next slides for a quick guide
- Cell parts and definitions
  - Refer to your notes from class
  - See next slide for a quick refresher

# Cell Parts

## ANIMAL CELL



## PLANT CELL



# Navigating Scratch

The image shows the Scratch programming environment. The top menu bar includes 'Settings', 'File', 'Edit', 'Cell Parts Matching Game', 'Shared', 'See Project Page', 'Tutorials', 'Save Now', and the user name 'msaharte'. The left sidebar contains various block categories: Motion, Looks, Sound, Events, Control, Sensing, Operators, Variables, and My Blocks. The main workspace is filled with code blocks for a 'Cell Parts Matching Game'. An orange arrow labeled 'Edit Cards' points to the 'Costumes' tab. Another orange arrow labeled 'Code' points to the code blocks. A third orange arrow labeled 'Sprites' points to the 'Sprites' panel on the right. The stage shows a grid of purple rectangles representing cell parts, with a text box describing a chloroplast: 'A flat, external layer that is specifically designed to provide structural support and rigidity. Chloroplast'. The 'Sprites' panel shows a 'Cell Membrane' sprite selected, with a grid of other cell parts like Golgi Body, Nucleus, Endoplasmic Reticulum, Mitochondrion, Chloroplast, Vacuole, and Ribosome. The 'Stage' panel shows the current sprite's position and size.

# Navigating Scratch

The image shows the Scratch programming environment. On the left is the 'Code' area with a sidebar of block categories: Motion, Looks, Sound, Events, Control, Sensing, Operators, Variables, and My Blocks. The main workspace contains several code blocks, including 'when clicked' events, 'set size to' and 'change size by' blocks, 'repeat' loops, and 'if' statements. An orange arrow labeled 'Code Functions' points to the code blocks. On the right is the 'Stage' area, which displays a grid of purple rectangles representing a cell. A text box on the stage reads: 'A thin, external layer that is specifically designed to provide structural support and rigidity. Chloroplast'. An orange arrow labeled 'Run Code' points to the 'Run Code' button in the top right corner. Below the stage is the 'Sprite' area, which shows a 'Cell Membrane' sprite selected. The 'Sprite' area also includes a 'Show' button, 'Size' (60), and 'Direction' (90) settings. Below the 'Sprite' area is a 'Backpack' area with a 'Create a New Sprite' button. An orange arrow labeled 'Create a New Sprite' points to this button. The 'Backpack' area also shows a 'Cell Membrane' sprite and a 'Win' sprite.

# Creating Your Own Game

- Click on <https://scratch.mit.edu/projects/881884745/> to access the game template
- Click on each sprite and edit their costume to fill in the cell parts and definitions that you want to include in your game
- Create a new sprite to appear when all cards have been matched



# Creating Your Own Game

- Write a code for the game winning sprite. What should happen when the game is won? How does the code know when the game is won?
- Edit the game to be your own!
- Explore the code. Can you figure out what each block does?

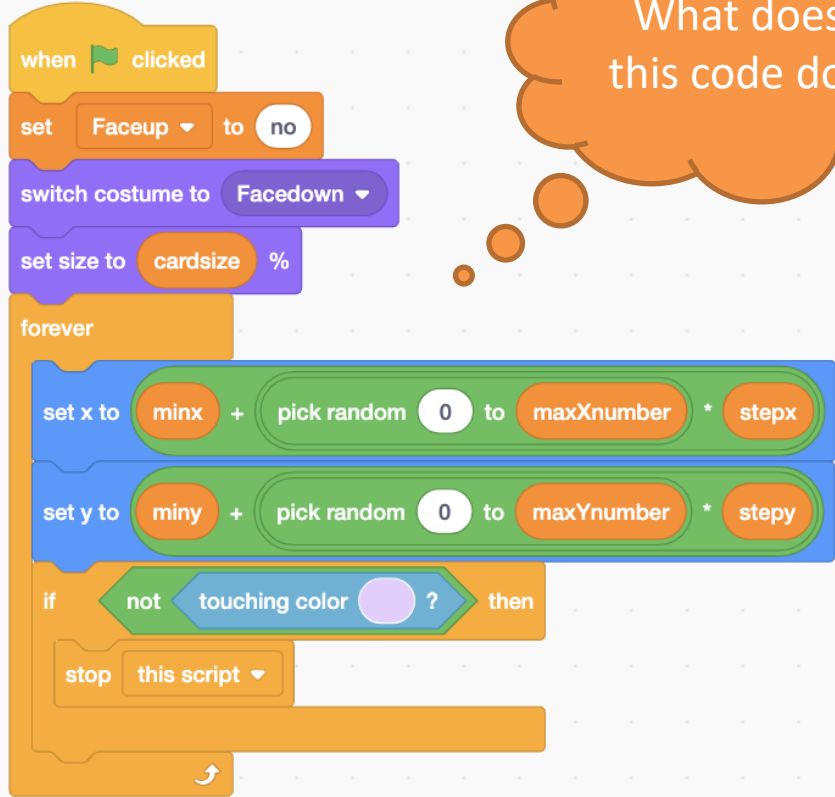
# Success Criteria

You will know you are finished when:

- You have filled in all the card contents
- The matching game works to pair parts and definitions
- There is some sort of acknowledgement when someone wins
- You have practiced biology terms and coding skills!

# Extension

Want to challenge yourself? See if you can figure out what the code in the template does!



```
when green flag clicked
  set Faceup to no
  switch costume to Facedown
  set size to cardsize %
  forever loop
    set x to minx + pick random 0 to maxXnumber * stepx
    set y to miny + pick random 0 to maxYnumber * stepy
    if not touching color ? then
      stop this script
```

What does this code do?

# Answer Key

The following slides contain the completed block code for each individual sprite as well as an example of a “win” condition

```

when clicked
  set Faceup to no
  switch costume to Facedown
  set size to cardsize %
  forever
    set x to minx + pick random 0 to maxXnumber * stepx
    set y to miny + pick random 0 to maxYnumber * stepy
    if not touching color [ ] then
      stop this script
  
```

```

when I receive win
  hide
  
```

```

when clicked
  show
  set name to cat
  
```

```

when this sprite clicked
  if Allow Click = yes then
    Flipcard
  
```

```

define Flipcard
  repeat 5
    change size by -10
  next costume
  repeat 5
    change size by 10
  if Faceup = yes then
    set Faceup to no
    change #Faceup by -1
  else
    set Faceup to yes
    change #Faceup by 1
  if #Faceup = 2 then
    broadcast 2up
  
```

```

when I receive check if up
  if Faceup = yes then
    add name to cards up
  
```

```

when I receive hide cards up
  if Faceup = yes then
    hide
    set Faceup to no
  
```

```

when I receive turnallcardsdown
  if Faceup = yes then
    wait 1 seconds
    Flipcard
  
```

# Example Win Condition

