# Engage: Cellular Highway: The Journey of Passive and Active Transport



## **Objective:**

Students will read a background piece on passive and active transport and then use an analogy or metaphor to explain the similarities and differences between these two processes in a 3-minute video using Loom or another method.

## Instructions:

- 1. Read the Background Piece:
  - Read the provided background information on passive and active transport.

## 2. Choose an Analogy or Metaphor:



 Select one of the provided analogies or metaphors to explain the concepts. You may also choose your own, but run it by your teacher to make sure you're on the right track!

## 3. Prepare Your Explanation:

• Use the sentence stems or frames to structure your explanation.

#### **4. Record Your V**ideo:

• Record a 3-minute video on <u>Loom</u> or another method, using the chosen analogy or metaphor to teach the similarities and differences between passive and active transport.

## Background Piece: Passive and Active Transport

#### Passive Transport:

 Passive transport is like a lazy river. In passive transport, substances move across the cell membrane without using any energy. They go from an area of high concentration (where there are many of them) to an area of low concentration (where there are fewer of them). This is called moving down the concentration gradient. Examples include diffusion, facilitated diffusion and osmosis.

## Active Transport:

 Active transport is like swimming upstream. In active transport, substances move against the concentration gradient, from an area of low concentration to an area of high concentration. This process requires energy because it is like pushing something uphill. An example is the sodium-potassium pump in cells, endocytosis, and exocytosis.

#### Analogies and Metaphors

Choose one of the following analogies or metaphors to explain passive and active transport. Use the sentence stems provided to help you create your explanation.

## 1. Lazy River vs. Swimming Upstream:

- Passive Transport: "Passive transport is like a lazy river because..."
- Active Transport: "Active transport is like swimming upstream because..."

## 2. Sliding Down a Slide vs. Climbing Up a Slide:

- Passive Transport: "Passive transport is like sliding down a slide because..."
- Active Transport: "Active transport is like climbing up a slide because..."

## 3. Rolling a Ball Downhill vs. Pushing a Ball Uphill:

- Passive Transport: "Passive transport is like rolling a ball downhill because..."
- Active Transport: "Active transport is like pushing a ball uphill because..."

## 4. Going with the Wind vs. Flying Against the Wind:

- Passive Transport: "Passive transport is like going with the wind because..."
- Active Transport: "Active transport is like flying against the wind because..."

## 5. Floating with the Current vs. Rowing Against the Current:

- Passive Transport: "Passive transport is like floating with the current because..."
- Active Transport: "Active transport is like rowing against the current because..."

## 6. Rolling Down a Hill vs. Hiking Up a Hill:

- Passive Transport: "Passive transport is like rolling down a hill because..."
- Active Transport: "Active transport is like hiking up a hill because..."

#### Example Sentence Stems/Frames

- "In passive transport, substances move from \_\_\_\_\_ to \_\_\_\_\_ without using \_\_\_\_\_."
- "An example of passive transport is \_\_\_\_\_, which is similar to \_\_\_\_\_ because
- "In active transport, substances move from \_\_\_\_\_ to \_\_\_\_ and this requires \_\_\_\_\_."
- "An example of active transport is \_\_\_\_\_, which is similar to \_\_\_\_\_ because \_\_\_\_."

#### **Recording Your Video**

- 1. Introduction: Start by introducing yourself and stating the purpose of your video.
- **2. Explanation**: Use the chosen analogy or metaphor to explain passive and active transport.
- 3. Conclusion: Summarize the key points and thank the viewers for watching.

#### **Submission**

• Submit the <u>Loom</u> or another method video link to your teacher by

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