

Visualizing Algorithms

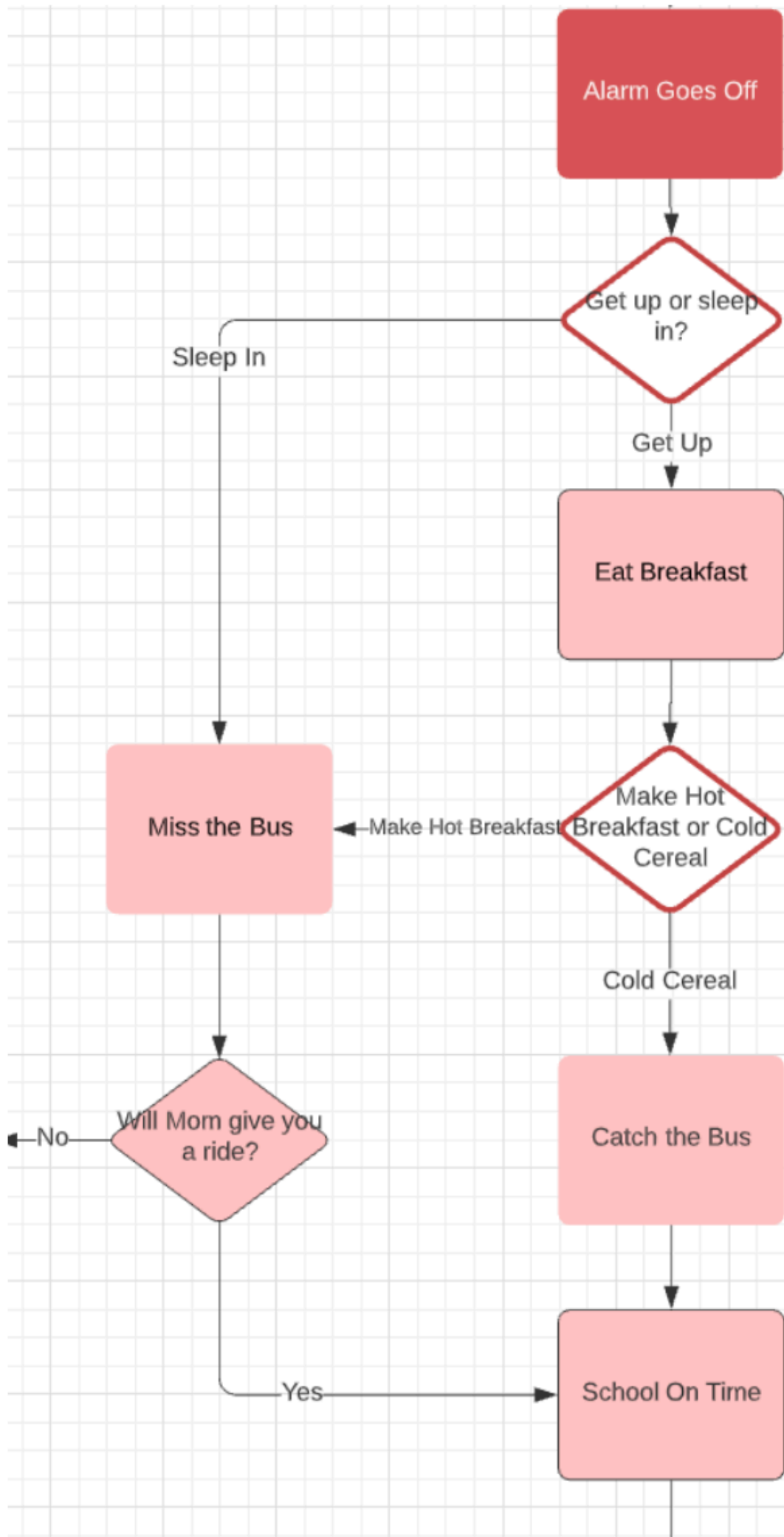
Textbook

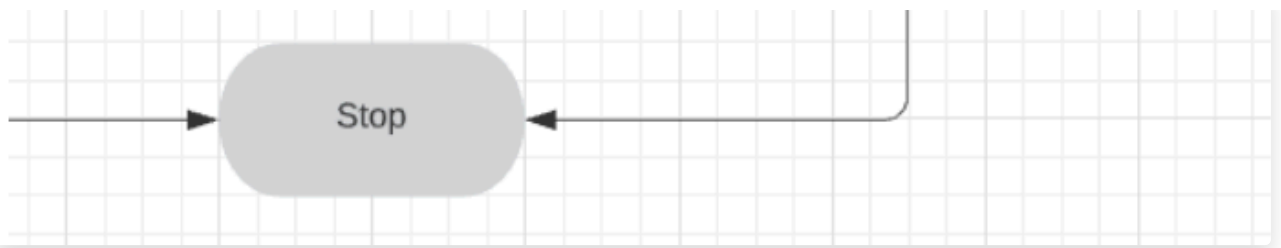
Visualizing Algorithms

[Algorithms](#) can sometimes get complicated with a lot of [iteration](#) and selection. At times it can be helpful to lay out your algorithm in a visual way to see what is happening.

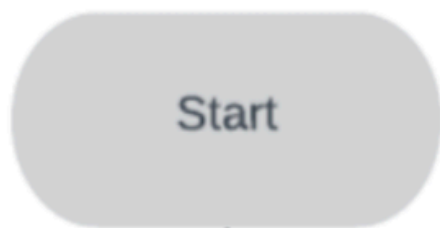
[Flow charts](#) can help us visualize our algorithms.

Here is an example of a flow chart for how to get to school.

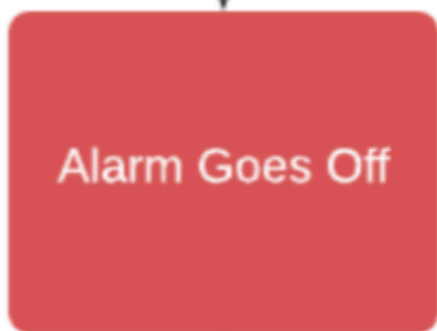




Notice the different shapes. What happens when you get to a rectangle? They represent something that happens. Diamonds represent decisions or conditions that change what the algorithm does depending on circumstances or choices.



Ovals are for Start/Stop



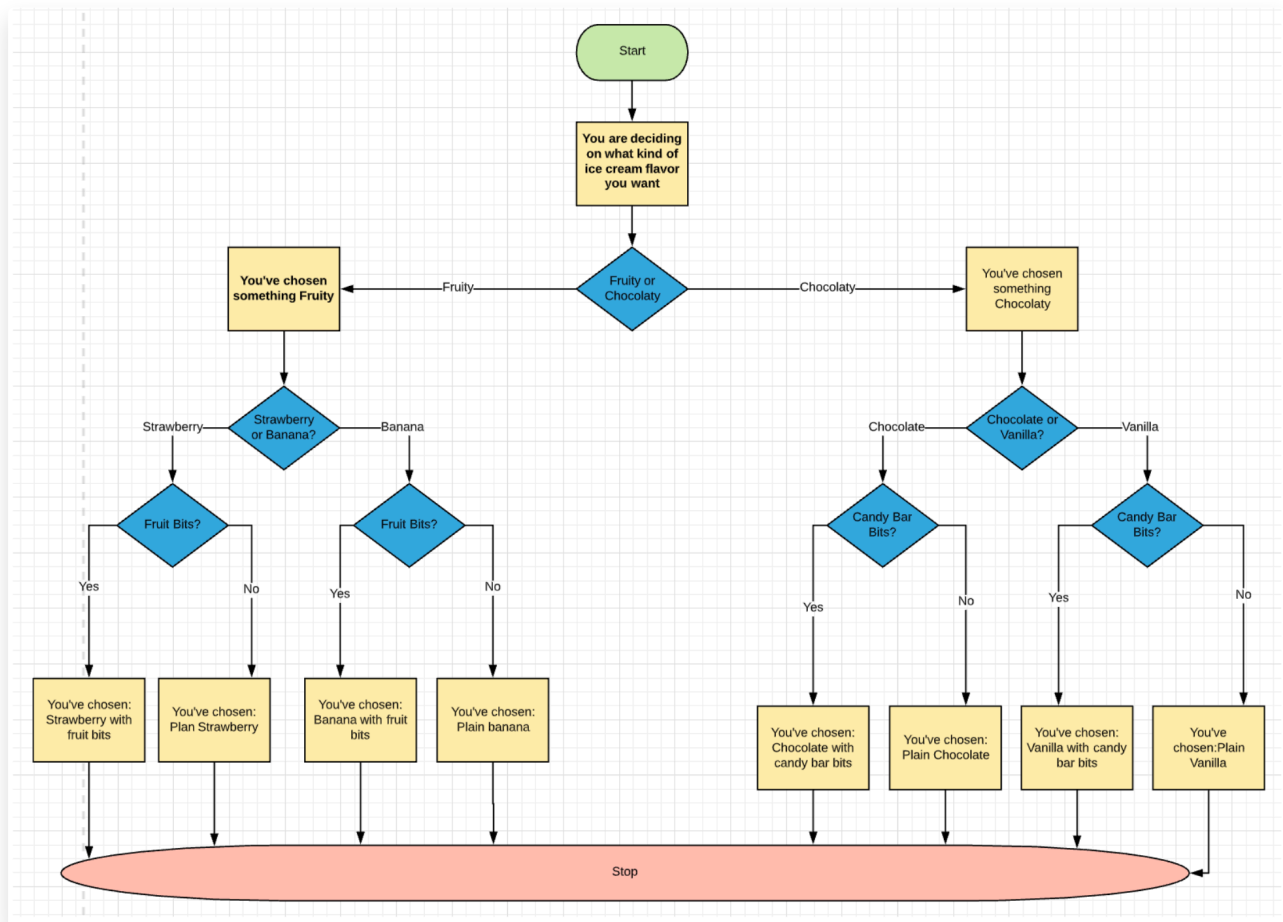
Rectangles are for Processes/what happens



Diamonds are for Decisions

Question: How might you map out an algorithm to calculate the total for a bunch of groceries?

Here is a flow chart showing an algorithm for choosing an ice cream flavor.



Try creating some flow charts of your own! How might you build a flow chart to pass one of the coding challenges?

Summary

[Flowcharts](#) can be helpful to map out an [algorithm](#). Flowcharts use shapes and arrows to communicate the life cycle of how decisions are made. Sometimes visualizing an algorithm can help to figure out how to build it in code.

AP Standards

AAP-2.A.2

3B-AP-13

Questions (5)

1. What is the term for a visual representation of an algorithm?

MULTIPLE CHOICE

Choose the correct answer:

- A. Flow chart
- B. photo
- C. png
- D. jpeg

MULTIPLE CHOICE

2. In the flowcharts, which shape is for the start/stop?

Choose the correct answer:

- A. oval
- B. diamond
- C. square
- D. star

MULTIPLE CHOICE

3. In the flowcharts, what shape is for the processes?

Choose the correct answer:

- A. oval
- B. star
- C. rectangle
- D. diamond

MULTIPLE CHOICE

4. In the flowcharts, what shape is for decisions?

Choose the correct answer:

- A. oval
- B. rectangle
- C. diamond
- D. star

5. True or False: At times it can be helpful to lay out your algorithm in a visual way to see what is happening.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

Answer Keys & Solutions

Questions

1. What is the term for a visual representation of an algorithm?

MULTIPLE CHOICE

Correct Answer:

- | | |
|---------------|-------------|
| A. Flow chart | ✓ Correct |
| B. photo | ✗ Incorrect |
| C. png | ✗ Incorrect |
| D. jpeg | ✗ Incorrect |

Explanation:

These consist of shapes and arrows that represent a step by step process.

2. In the flowcharts, which shape is for the start/stop?

MULTIPLE CHOICE

Correct Answer:

- | | |
|------------|-------------|
| A. oval | ✓ Correct |
| B. diamond | ✗ Incorrect |
| C. square | ✗ Incorrect |
| D. star | ✗ Incorrect |

Explanation:

Options are start/stop, decisions, and processes

3. In the flowcharts, what shape is for the processes?

MULTIPLE CHOICE

Correct Answer:

- | | |
|---------|-------------|
| A. oval | ✗ Incorrect |
|---------|-------------|

B. star

✗ Incorrect

C. rectangle

✓ Correct

D. diamond

✗ Incorrect

Explanation:

Processes are what happens.

4. In the flowcharts, what shape is for decisions?

MULTIPLE CHOICE

Correct Answer:

A. oval

✗ Incorrect

B. rectangle

✗ Incorrect

C. diamond

✓ Correct

D. star

✗ Incorrect

Explanation:

Options are start/stop, decisions, and processes

5. True or False: At times it can be helpful to lay out your algorithm in a visual way to see what is happening.

MULTIPLE CHOICE

Correct Answer:

A. True

✓ Correct

B. False

✗ Incorrect

Explanation:

This approach is called a flow chart.