

Object-Oriented Fun

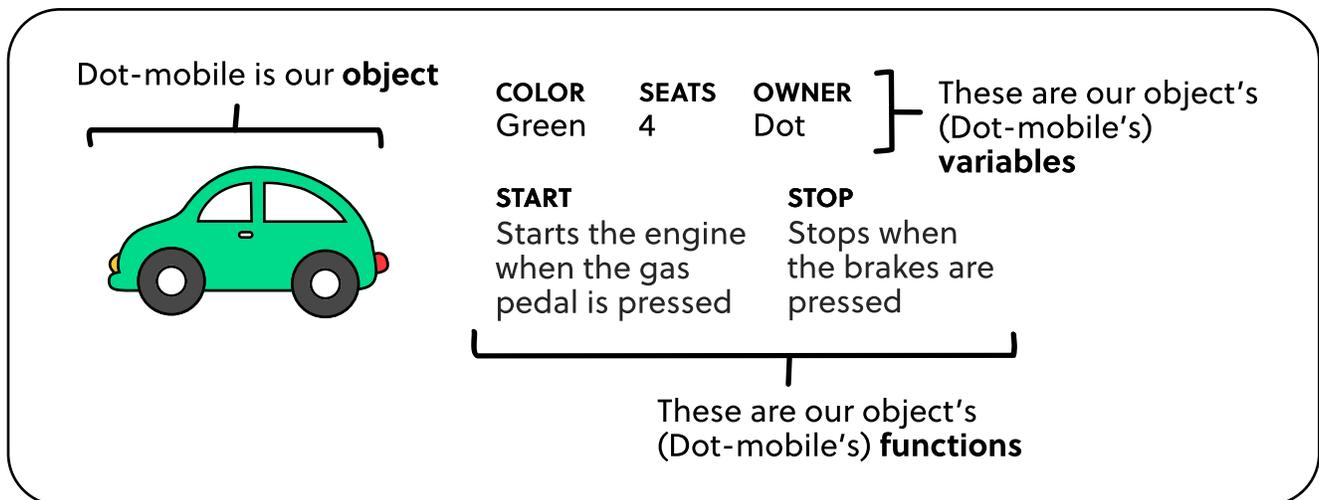
Drivin' Around Decomposphere

Welcome back to the scenic landscape of Decomposphere! Get ready to follow Dot around in his Dot-mobile to learn about object-oriented programming.

Vroom Vroom...

We can use **object-oriented programming** to model objects using variables and functions. We can represent just about anything using variables and functions, from cars to dogs to houses!

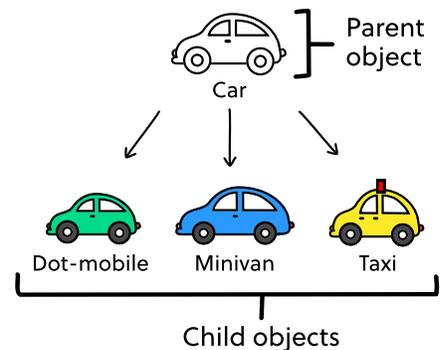
In Decomposphere, Dot and his friends love driving around town and catching the summer breeze. Let's take a deeper look at object-oriented programming through Dot's car: the Dot-mobile!



More cars!

On the right, we can see that the Dot-mobile, minivan, and taxi are all different types of cars.

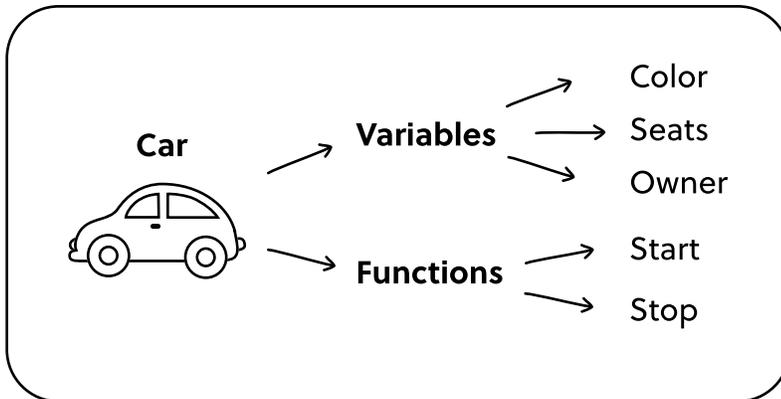
Looking at the complete picture, Dot-mobile belongs to a large **group** of cars. Since all of these cars share **similar features**, we can create specific types of vehicles like the



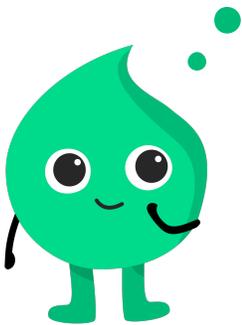
Dot-mobile, Minivan, and Taxi (these are called child objects) from the car (this is called the parent object).

We call the car our parent object because it **passes down shared variables and functions** to its child objects.

Let's take a closer look at the parent object:



Since all cars have a specific color, number of seats, owner, and can start and stop, **every child car** (the Dot-mobile, Minivan, and Taxi) **shares the same structure as the parent car**.



Why is Object-Oriented Programming useful?

Programs often have lots of code, which can become **messy and complicated**. When we have similar objects that share similar qualities but are not exactly the same, we can use inheritance (the passing down of features) in object-oriented programming to take the features of a parent object and apply them to its child objects. This template saves us time when creating child objects.

Referencing back to our car example, we can use our parent car object to create other cars like limousines or electric cars!

Let's Review Functions!

A **function** includes **actions** used to complete a task. Here's a quick refresher on how we can create our own functions:

Write the **steps**
necessary to
accomplish our
function



Honk a Car Horn
Press the button at the
middle of the steering wheel

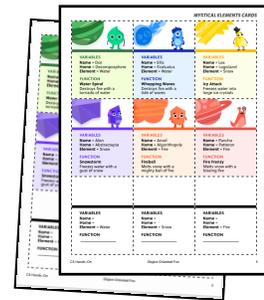
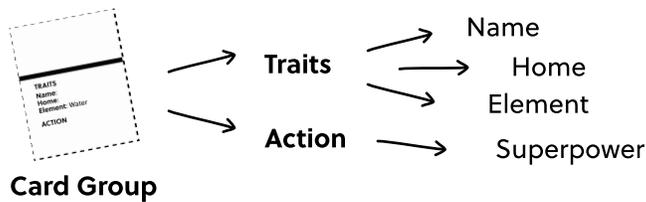
Include a descriptive **title**

Mystical Elements: The Game

Use your knowledge of object-oriented programming to play a fun game of Mystical Elements with a friend! The first six cards each represent an object (a character from our six planets) with its unique variables and functions on your Card sheet. Each function is a superpower that relates to water, snow, or fire.

Setup

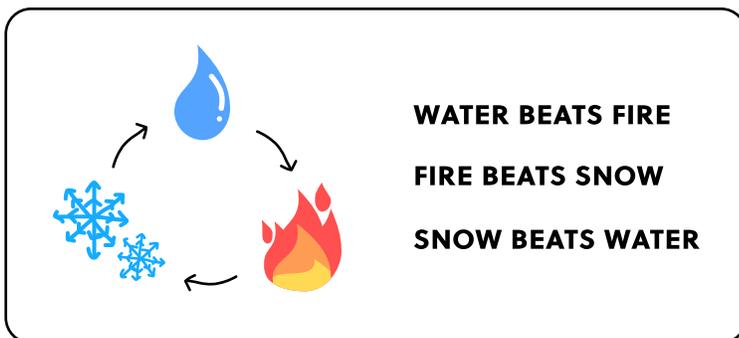
- Customize three different child objects on your Card sheet from the parent Card object. Assign your child objects variables (name and home) and a superpower function!



- Once you finish customizing your child object cards, carefully cut the cards out along dashed lines.

How to Play

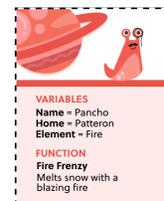
- From your nine cards, pick one card to play and place it face down.
- Once both of you have placed your cards down, flip them face up and compare your object's **element** variable to decide the winner! Water puts out fire, fire melts snow, and snow freezes water.
- The player who wins the round takes both cards.
- The player with the most cards wins!



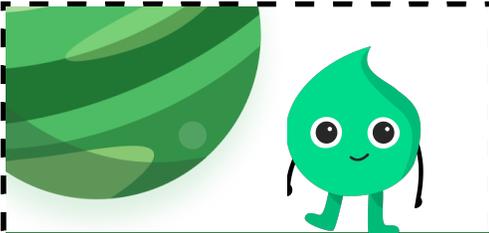
Ex. Water beats fire



WATER CARD



FIRE CARD



VARIABLES

Name = Dot
Home = Decomposphere
Element = Water

FUNCTION

Water Spiral
 Destroys fire with a
 tornado of water

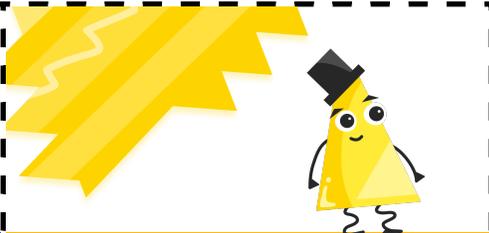


VARIABLES

Name = Ellis
Home = Evaluatus
Element = Water

FUNCTION

Whopping Waves
 Destroys fire with a
 tide of waves

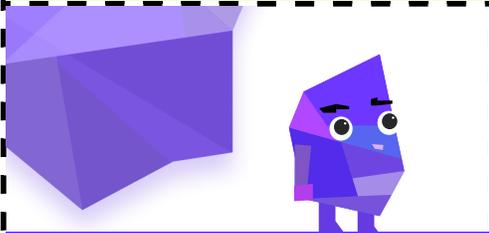


VARIABLES

Name = Lex
Home = Logicland
Element = Snow

FUNCTION

Icy Attack
 Freezes water into
 large ice crystals

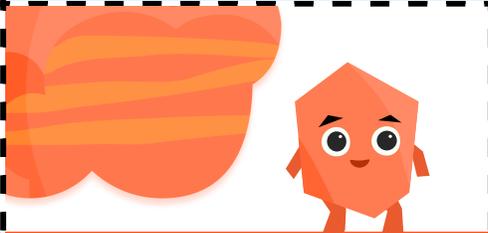


VARIABLES

Name = Alon
Home = Abstractopia
Element = Snow

FUNCTION

Snowstorm
 Freezes water with a
 gust of snow

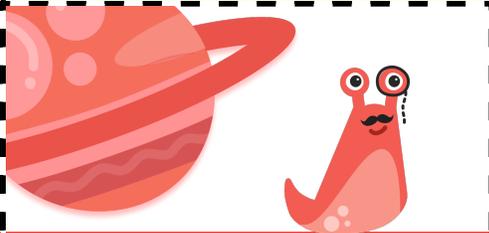


VARIABLES

Name = Ansel
Home = Algorithmopoly
Element = Fire

FUNCTION

Fireball
 Melts snow with a
 mighty ball of fire



VARIABLES

Name = Pancho
Home = Patteron
Element = Fire

FUNCTION

Fire Frenzy
 Melts snow with a
 blazing fire

VARIABLES

Name =
Home =
Element = Water

FUNCTION

VARIABLES

Name =
Home =
Element = Snow

FUNCTION

VARIABLES

Name =
Home =
Element = Fire

FUNCTION
