

Object-Oriented Fun

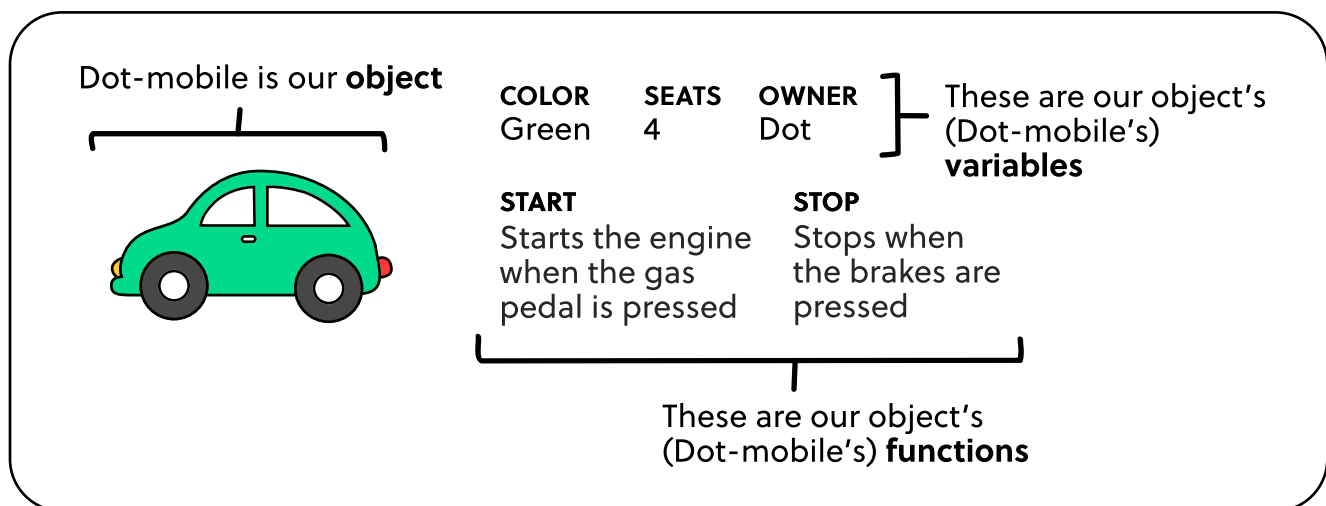
Drivin' Around Decomposphere

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!

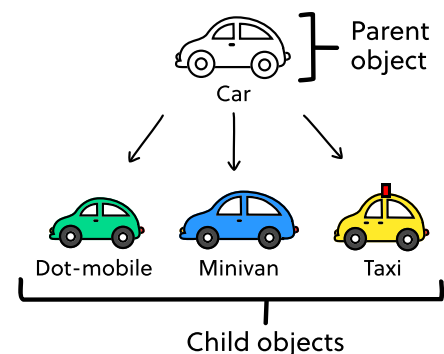
In Decomposphere, Dot and his friends love driving around town and catching the summer breeze. Let's take a deeper look at object-oriented programming through Dot's car: the Dot-mobile!



More cars!

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

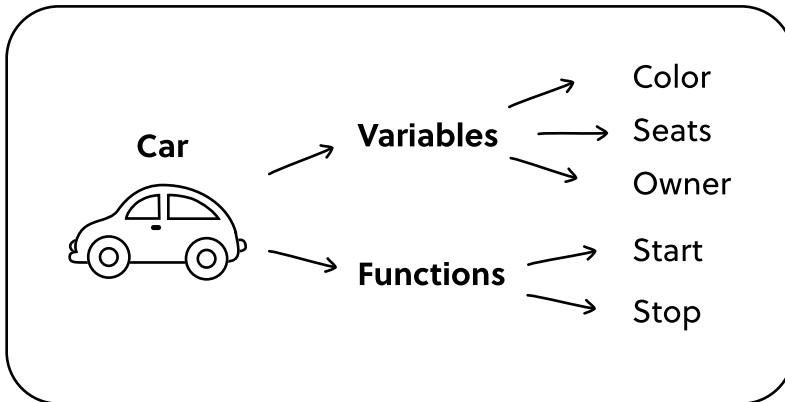
Looking at the complete picture, Dot-mobile belongs to a large **group** of cars. Since all of these cars share **similar features**, we can create specific types of vehicles like the



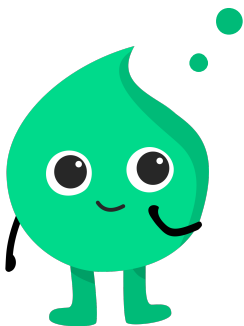
Dot-mobile, Minivan, and Taxi (these are called child objects) from the car (this is called the parent object).

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

Include a descriptive **title**

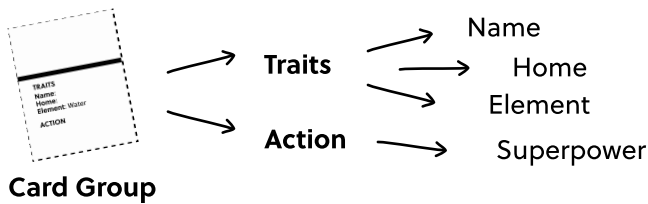
Press the button at the
middle of the steering wheel

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

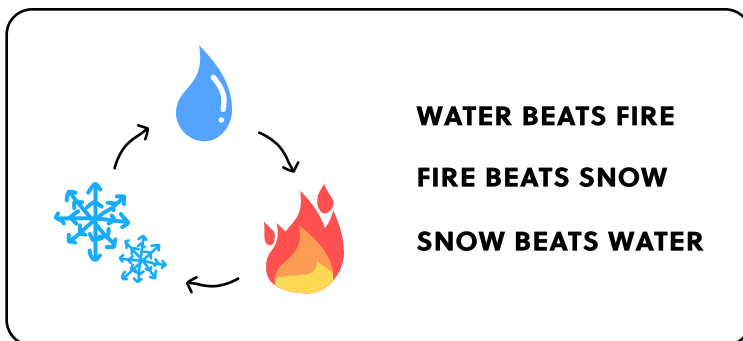
- Customize three different child objects on your Card sheet from the parent Card object. Assign your child objects variables (name and home) and a superpower function!



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

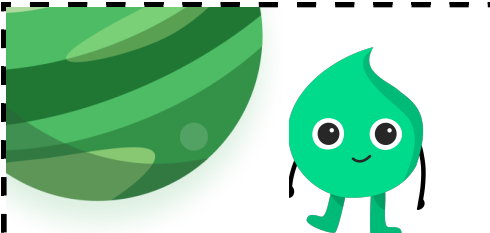
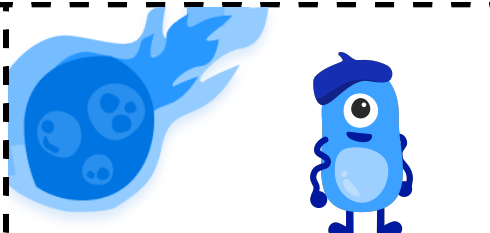
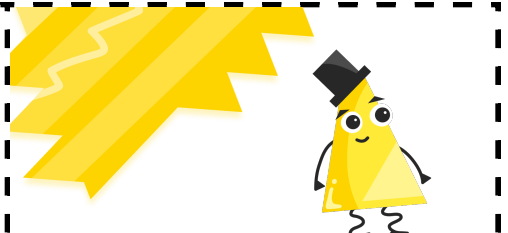
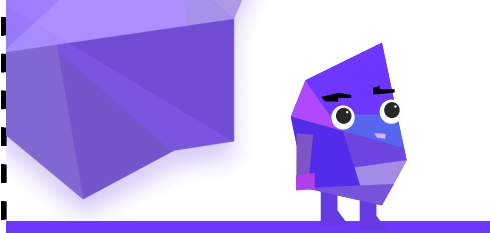
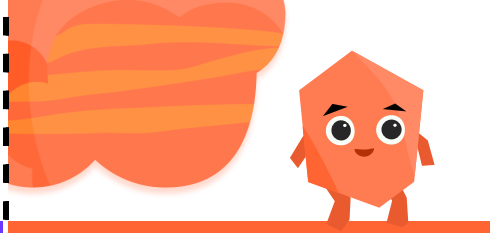

How to Play

- 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



 <p>VARIABLES Name = Dot Home = Decomposphere Element = Water</p> <p>FUNCTION Water Spiral Destroys fire with a tornado of water</p>	 <p>VARIABLES Name = Ellis Home = Evaluatus Element = Water</p> <p>FUNCTION Whopping Waves Destroys fire with a tide of waves</p>	 <p>VARIABLES Name = Lex Home = Logicland Element = Snow</p> <p>FUNCTION Icy Attack Freezes water into large ice crystals</p>
 <p>VARIABLES Name = Alon Home = Abstractopia Element = Snow</p> <p>FUNCTION Snowstorm Freezes water with a gust of snow</p>	 <p>VARIABLES Name = Ansel Home = Algorithmopoly Element = Fire</p> <p>FUNCTION Fireball Melts snow with a mighty ball of fire</p>	 <p>VARIABLES Name = Pancho Home = Patteron Element = Fire</p> <p>FUNCTION Fire Frenzy Melts snow with a blazing fire</p>
<p>VARIABLES Name = Home = Element = Water</p> <p>FUNCTION _____</p>	<p>VARIABLES Name = Home = Element = Snow</p> <p>FUNCTION _____</p>	<p>VARIABLES Name = Home = Element = Fire</p> <p>FUNCTION _____</p>