Name: _____ Date: _____

Object Attack

Outstanding Objects!

Dot is so excited to see you back at Decomposphere! Today, you'll learn more about objects and how they can keep their properties out of sight. Let's jump right in!

Who let the dogs out?

In object-oriented programming, **encapsulation** allows for the variables and functions of an object to be encapsulated or kept private from the interference of other objects. Each object can have private and public properties.

What's the difference between private and public?

While private properties (variables and functions) cannot be changed or used by other objects, public properties can. Let's take a look at an example with Dot's pet dog, Rocky!

Rocky the Labrador

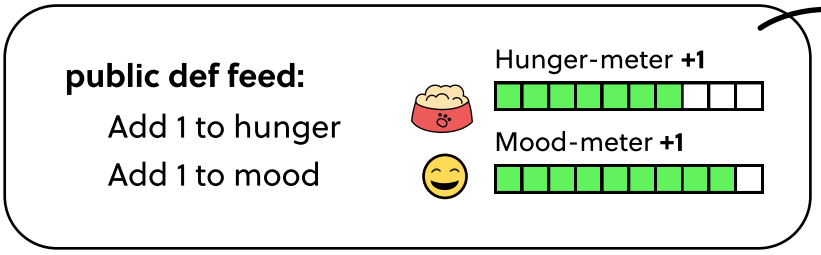
Variables (attributes Rocky has)		Functions (what Rocky does)	
private breed **private** age	**Why private?** We can't control Rocky's breed and age.	**private** bark **private** sleep	**Why private?** We can't control when Rocky barks or sleeps
public owner	**Why public?** We can control who owns Rocky	**public** feed **public** play	**Why public?** We can control when to feed or play with Rocky

Why do we use private properties?

In programming, it's essential to make properties like breed, mood, hunger, and energy level private to **protect other objects from changing them**.

How can we change private variables?

We can give our object certain **functions to change these private variables**!
For example, let's take a look at our public function **feed**:



Since our feed function is public (we can decide when to feed Rocky), we can indirectly change our private variables (hunger and mood).

However, some private variables can never be changed.
For example, we cannot change Rocky's breed as a Labrador.

Grid Attack!

In this action-packed game, you will be creating your own **player object** with its **private/public variables and functions** to attack an opponent!

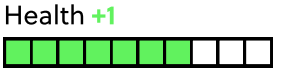
Materials

- 2 tokens for you and your friend (This will represent where you are on the board!) 
- 1 die 

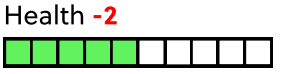
How to Play

- Define your player object's variables by creating a name, age, and health value. Each player starts the game with a health level of 5 (out of 5). Next to each variable and function, circle whether it is private or public! *(Think: Can these properties be directly changed or used by other objects?)*
- Take turns rolling the die with your friend. Use the **walk** function to move your token the number of steps you rolled in any direction(up, down, left, right). Keep track of your activity in your **activity list**.
  (Ex. If you rolled a 6, you can choose to walk 3 steps left and 3 steps up).

  If you are on  , use the **eat** function to add 1 point to your health.

  If you are at the **same location** as your opponent, use the **attack** function to subtract 2 points from your opponent's health.

- Winning the game: You win the game when your opponent's health status reaches 0.

My Player Object

Variables

private/public Name
(circle one)

private/public Age
(circle one)

private/public Health
(circle one)
5

Functions

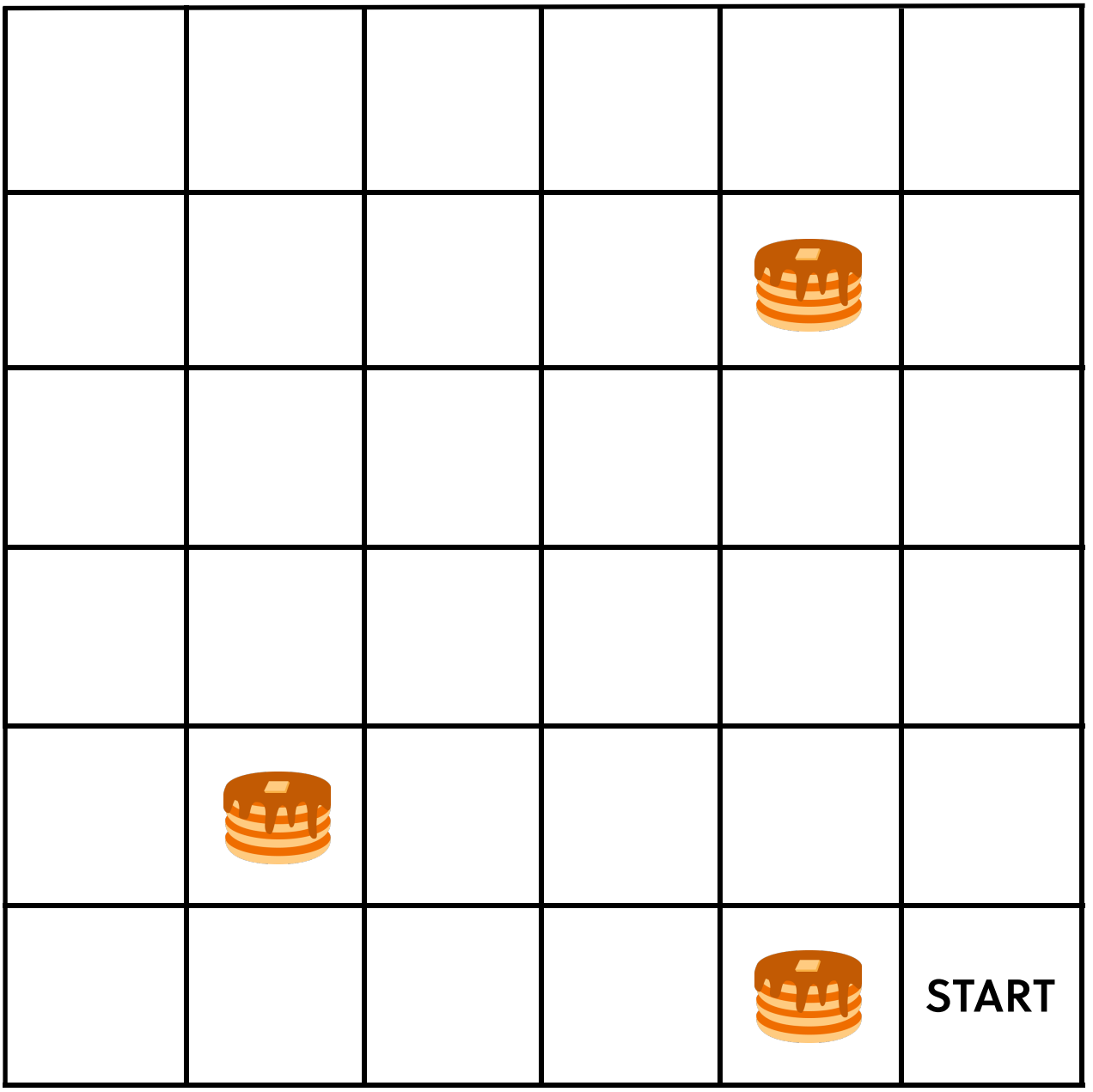
private/public def Walk:
(circle one)
Move the number of steps rolled

-2
private/public def Attack:
(circle one)
Subtract 2 points from opponent's health

+1
private/public def Eat:
(circle one)
Add 1 point to your own health

My Activity List

Function	Health	Function	Health
Ex. Walk left 3 steps	5		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