Practice 10: Blocks that return values

Module 3: Functions and Abstraction

What is a "Reporter" block?
So far you have created *command* blocks (jigsaw shape). But there are oval-shaped blocks that don't "do" something visual; instead, they **calculate data** and return it. In the real world, a temperature sensor is a "reporter": you ask it and it returns a number to you.

Practice Objectives

- Create **Reporter** blocks (oval shape).
- Learn to use the `report` block (the *return* statement in programming).
- Perform mathematical calculations inside a block to simplify the main program.

Visual Difference

- **Command:** It has notches to fit top and bottom. It is used to give orders (*Move, Turn, Pen down*).
- **Reporter:** It is oval. It doesn't snap; it **fits inside** other blocks. It is used to provide information (*X position, Answer, Operations*).

THE CHALLENGE: The Area Calculator

Let's create a tool to help your math classmates calculate areas quickly.

Steps to follow:

1. **Create the "Triangle Area" block:**
   - Click on +. Select the **Operators** category (green).
   - Select the **Reporter** type (the oval shape).
   - Name: `triangle area base: [b] height: [h]`.
   - Inside the block, use the `report` block and the formula: $(b \times h)/2$.
2. **Create the "Circle Area" block:**
   - Type: **Reporter**. Parameter: `radius`.
   - Formula: $\pi \times radius^2$. (Tip: You can use the `pi` block in Snap!).
3. **Main program:**
   - The character should ask the user: "What is the radius of the circle?".

- The character should **say** the result using your new green block.

Why do this?

Imagine you have to calculate the area 50 times in your program. It is much easier and safer to drag a block that says `circle area` than to write the full formula with multiplications and the Pi number every time. **If you make a mistake in the formula, you only have to fix it in one place!**

Text-Based Language Code (JavaScript)

This is how programmers write these functions that return values:

```
// 1. Define the reporter function for the triangle
function triangleArea(base, height) {
   return (base * height) / 2; // The "report" block in Snap!
}

// 2. Define the function for the circle
function circleArea(radius) {
   return Math.PI * Math.pow(radio, 2);
}

// 3. Usage example: we store the value in a variable
let myResult = triangleArea(10, 5);
console.log("The calculated area is: " + myResult);
```

*Note: In the Snap! block, the **report** command (inside the Control/Variables category when editing the block) is what makes the value "go out" to the outer block.*