Name: _____

Period: _____

## UNIT: ELECTRICAL CIRCUITS

# MOTION DEFENSE SPINNER

**OBJECTIVE:**

Use electrical energy to create movement and defend your base!

**MATERIALS:**

- ✓ Small DC motor
- ✓ Battery + holder (AA or 9V)
- ✓ Paper fan blades or spinner
- ✓ Cardboard or jungle platform (your mount)
- ✓ Tape, straw, and scissors
- ✓ Jumper wires or foil strips
- ✓ Optional: different battery sizes or weights

**STUDENT DIRECTIONS:**

**Step 1:** Assemble the Power Core
- Connect your motor terminals to the battery using jumper wires or foil strips.
- Make sure your connections are secure and wires aren't crossing.

**Step 2:** Build the Jungle Fan
- Cut out a paper fan or spinner with large "blades."
- Use tape to attach it firmly to the shaft of the motor (centered!).
- Add a straw if needed to elevate or extend your motor mount.

**Step 3:** Construct the Mount
- Mount the motor to cardboard (this is your Base Defense Platform).
- Tilt it slightly, or make it upright, depending on your defense style.

**Step 4:** Test + Troubleshoot
- Power it up!
- What happens when you reverse the wires? What direction does it spin now?
- Try tilting the fan, or making the blades bigger. Does the speed change?
- Add more weight or try a different battery. What happens?

**Test & Record:**

| Test Variable | What You Changed | What Happened? |
|---|---|---|
| Default Setup | | |
| Reversed Wires | Changed polarity | |
| Increased Fan Size | Larger blades | |
| Battery Type | Swapped voltage | |
| Tilted Base | Changed angle | |

**Mission Reflection:**

- What type of energy is stored in your battery?

  _____

  _____

- What kind of energy did it turn into?

  _____

  _____

- What helped your fan spin faster or better? Why?

  _____

  _____

- If you added one more feature to improve defense, what would it be?

  _____

  _____

**Bonus Mission (Optional):**

- **Design a Jungle Alert System** — Add a light or buzzer that activates when the motor is running! You'll combine motion + sound/light for ultimate base defense.

**STANDARDS ALIGNMENT**

**NGSS:** MS-PS3-5 **STEL:** STEL 1B, STEL 2B, STEL 3B, STEL 4B, STEL 5B, STEL 7B, STEL 8B **CCSS:** CCSS.MATH.CONTENT.6.RP.A.3, CCSS.MATH.CONTENT.7.EE.B.3, CCSS.MATH.CONTENT.6.SP.B.4–5, CCSS.MATH.PRACTICE.MP2, CCSS.MATH.PRACTICE.MP4, CCSS.MATH.PRACTICE.MP5