Mission: Sparx needs a detective

Fixing Sparx • Ages 4–9 • 35–45 minutes + reading

Big question

How can we find a problem without changing everything at once? Children inspect a pretend robot panel, use a rule card, make one repair, and retest. This is a paper model of troubleshooting, not real electronics repair.

After the story

Ask: What clue would you check first when Sparx stops working? What is the difference between looking carefully and guessing? Partners retell a problem–clue–try–result sequence using four quick pictures. Invite several sensible starting checks.

Prepare one pair kit

Student pages 1–2; pencil and four coloring tools; four thick pieces of yarn or reusable paper strips; tape; one paper ON/OFF card. No batteries, electrical wires, tools, motors, magnets or opened devices are needed. Use large pieces for younger pupils; teacher cuts optional cards.

Our pretend-panel rule card

A red circle lead belongs to port 1 (red circle). A blue square lead belongs to port 2 (blue square). A green triangle lead belongs to port 3 (green triangle). A yellow star lead belongs to port 4 (yellow star). Each lead uses its own port. The paper power card must say ON. These are fictional game rules, not rules for real wire colors.

Teacher sets the starting fault

Use one of the fault missions on the next page. Describe or draw its starting connections on a separate copy; keep the answer covered. Partners alternate detective and recorder. A child can point or place yarn rather than draw.

Classroom boundaries

Never open Sparx-like toys or real devices for this activity. Do not use wall sockets, mains cables, loose batteries or button cells. Paper switches are symbolic. Loose yarn stays on the table and is not tied around bodies. Stop if materials create an access or small-parts risk.

Find • Fix • Test

Fixing Sparx • Teacher notes

1. Read the rule card together. Name both shape and color; color alone is not needed to solve the challenge. Predict one possible cause before making a repair.

2. Inspect the teacher’s starting panel. Trace one lead with a finger or pencil. Compare its destination to the rule card.

3. Record a clue: “I can see ___.” Choose ONE connection or the paper power card to change. Explain why that change is a sensible next test.

4. Make the change and retest against ALL five checks: four matching connections plus power ON. Say “ready” only when every check passes.

5. If the check fails, record what it tells you and try one new change. A failed test narrows the problem; it is not a personal failure.

6. Swap roles and try a new fault mission. End by teaching another pair your troubleshooting steps without revealing their answer.

Fault mission cards — teacher may read aloud

A / MIXED UP: red circle goes to port 2, blue square to port 1, green triangle to port 3, yellow star to port 4. Power is ON. Fix one lead, test, then fix the other.

B / MISSING LINK: red to port 1, blue to port 2, green disconnected, yellow to port 4. Power is ON. The loose end is a clue; do not change correct connections.

C / SLEEPY SPARX: all four leads match their own ports. The paper power card says OFF. Inspect the whole system before changing wires.

Suggested timing

Story discussion 7 min; rule practice 5 min; first mission 10 min; swap and retry 10 min; share evidence 5 min.

Teacher look-fors & answers

Fixing Sparx • Teacher notes

Notice learning, not just the final product

Notice whether a child traces a lead, names a mismatch or missing link, tests all the rules, and changes one thing at a time. A correct final picture without an explanation is a chance to ask for evidence.

Teacher look-fors / possible answers

Mission A: red→1 and blue→2; both need correction. After correcting one, the test still fails because the second is wrong. Mission B: reconnect green→3. Mission C: turn the PAPER card to ON. The student puzzle on page 1 starts blank so students can draw the correct final system.

Extend the adventure

Use the virtual Fix Sparx lab to inspect the chest panel and apply the same matching method. Then transfer the habit to a non-electrical problem: a marker with its cap on, missing puzzle piece, or blocked toy-car path. Ask how the evidence changes the next test.

Make room for every learner

Ages 4–6: draw, point, act out a prediction, or dictate to an adult; work with a partner. Ages 7–9: label a diagram, record evidence, and explain a change. Offer large-print copies, pre-cut materials and picture choices. Accept oral responses; do not assess handwriting as science understanding.

Exit ticket

“At first I thought ___. My evidence showed ___. Next I would ___.” Invite children to share one kind, helpful thing a teammate did.

Language that keeps the team curious

Try “What does this clue tell us?” and “Which one change will we test?” Avoid “You broke it” or “That was easy.” Celebrate careful checking, communication and revision.

My Sparx control panel

Fixing Sparx • Name: _____ Date: _____

MISSION: Draw a lead to its matching port. Use the shape and number as well as color. Then make a PAPER power card that says ON. This is a pretend robot, not real wiring.

● RED CIRCLE	1 ● PORT
■ BLUE SQUARE	2 ■ PORT
▲ GREEN TRIANGLE	3 ▲ PORT
★ YELLOW STAR	4 ★ PORT

Our paper power card: ON / OFF All four leads match: YES / NOT YET

A clue I would check first is...

Draw a happy Sparx when every check passes.

My troubleshooting log

Fixing Sparx • Keep thinking. Keep trying.

Teacher mission: A / B / C Partners: _____

Clue I noticed	ONE thing I changed	Retest: ready / not yet

What finally helped Sparx? Show the evidence.

A troubleshooting habit I can use again...

Finish together: Look closely → choose one change → test → use the result.