

LESSON 1

Fold-a-Fish: Why Clear Steps Matter

40 minutes

Unplugged Adventures

WHAT THIS LESSON DOES

As a teacher, guide your students through a hands-on activity to highlight the importance of clear instructions. Lead them in creating an origami fish, first with vague guidance, then with precise steps, to contrast the outcomes and teach the value of structured directions.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand the importance of clear, ordered instructions in achieving accurate results.
- Compare the effectiveness of guided versus unguided processes in task completion.
- Recognise how step-by-step algorithms improve speed and reduce errors.
- Reflect on personal experiences to evaluate the impact of structured guidance.
- Connect the concept of algorithms to real-world problem-solving and coding principles.

BEFORE THE LESSON

- This lesson is unplugged: no devices needed. Have two sheets of paper per pupil ready.
- Origami works best with square paper. Cut squares in advance with a guillotine, or plan time for pupils to trim their own.
- Fold the fish yourself once beforehand so you can model each step confidently and pace the class. The folding algorithm, to read one step at a time (the lesson also shows a six-panel guide on screen): 1. Turn the square like a diamond, one corner up and one down. 2. Fold the bottom corner up to the top corner and press flat: a triangle, fold along the bottom, a corner left, a corner right, a point on top. 3. Leave the left corner as the nose. Fold the right corner over to the left until its point touches the middle of the bottom edge; press flat. 4. Fold that same corner back to the right so the point pokes out past the edge by a finger's width; press flat. That is the tail. 5. Optional: fold the very tip of the nose in a little to make a mouth. 6. Press every fold flat again. Nose left, tail right.
- Have a visible class timer for the first attempt.

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HOW THE LESSON RUNS

Introduction

The Vague Instruction

The First Reflection

The Clear Instruction

Compare the Two Fish

Naming the Algorithm

Optional Pair Challenge: Algorithm Masters

TEACHING MOVES

- 2. The Vague Instruction. State only the goal: fold the paper into a fish, no cutting, tearing, drawing or colouring. Give no hints or examples. Let the uncertainty happen. Set the timer for five minutes.
- 3. The First Reflection. Ask how it felt and what was hardest. Jot a few of their exact phrases on the board so you can point back to them later as the problem the algorithm solves.
- 4. The Clear Instruction. Hand out a fresh square. Put the six-panel fold guide on the board and read one step at a time, folding your own paper as you speak. Pause after each fold until every pupil has caught up, and do not let them race ahead. If pupils have the lesson on their own screens, they should keep it closed until now.
- 5. Comparison discussion. Have pupils hold both fish up together. Ask what the second attempt gave them that the first did not, and how much time they wasted just deciding what to do the first time.
- 6. Naming the algorithm. Give the concept its name: a clear, ordered set of steps is an algorithm. Stress that a computer cannot guess, unlike them on attempt one, so the clearer the steps the fewer the errors.
- 7. Optional Pair Challenge: Algorithm Masters. In pairs, challenge pupils to rewrite the fish algorithm in fewer steps without losing clarity. Ask them to read their shorter version aloud and test whether it still produces a fish.

WHAT TO WATCH FOR

- Pupils think their first, unguided attempt failed because they are bad at folding, rather than because the instruction was unclear. Point back to the phrases you captured on the board and reframe: the goal was clear but the steps were missing. The second fish proves the difference was the instructions, not them.
- Pupils believe a computer can fill in gaps or work out what you meant, the way a person might. Return to attempt one. They had to guess because no steps were given, and everyone guessed differently. A computer cannot guess at all: it does exactly and only what the ordered steps say.

DIFFERENTIATION

- Emerging: During the guided fold, stand near pupils who fall behind and let them mirror your paper directly before you move to the next step.
- Developing: Ask them to say the next fold back to you in their own words before doing it, so they are following the sequence rather than copying the shape.
- Proficient: Move them straight to the pair challenge: rewrite the algorithm in fewer steps and test that it still works.