

GRADE 3 LEARNING PACK

Algorithm Trace & Debug

Trace step-by-step instructions, identify the first error and revise an algorithm.

LEARN • PRACTISE • CREATE • REFLECT

Original BrightPencil Kids resource - adult-led where appropriate

A4 edition • 12 purposeful pages • review copy

Print. Learn. Grow.

Grown-up guide

Learning objective

Trace step-by-step instructions, identify the first error and revise an algorithm.

Use this pack well

- Model the first example aloud, then let the learner try.
- Ask “How do you know?” more often than “Are you finished?”.
- Use real objects, talk, movement or observation when the activity suggests it.
- Stop or shorten the session if attention or enjoyment drops.
- Open-ended pages can have many successful answers.

Quality note

This resource was written originally for BrightPencil Kids. Curriculum sources informed scope and progression only; no third-party worksheet or story text is reproduced.

Learn the idea

1 Algorithms are precise sequences of instructions.

2 Debugging locates and fixes errors.

3 A fix should be retested from the start or relevant state.

Talk about it

Explain one idea in your own words. Give an example from real life, a drawing or an object if that helps.

Trace a robot route with six commands.

Find the first command that hits an obstacle.

Replace one command and retest.

Compare two algorithms that reach the same goal.

Write a repeat instruction for a repeated movement pattern.

Try it beyond the page

Real-world / hands-on connection

Act out one algorithm physically in a safe clear space or use Code Factory.

Before you finish

What did you notice?

What evidence, object or example helped you?

What would you change if you tried again?

Create something

Your project

Create a ten-step maze algorithm containing one intentional bug and provide a debugging note.

Use this space for planning, drawing, mapping, designing or notes.

CHALLENGE

Think deeper

1. Which strategy reduced uncertainty or work?

2. How did you verify the final answer?

3. When would changing strategy be sensible?

Quick review

1. In one sentence, explain the big idea of “Algorithm Trace & Debug”.

2. Draw or write one example that shows you understand.

3. Choose one activity from this pack and explain the strategy you used.

4. Write one question you still have.

Answer & discussion notes

Use these as guidance, not scripts. Open questions can have different successful responses when the reasoning is sensible and evidence-based.

1. Suggested response

Name the strategy and why it fit.

2. Suggested response

Use a second method, inverse operation, full clue check or model as appropriate.

3. Suggested response

When the current method is inefficient, confusing or produces a contradiction.

Review before publication

Check age fit, factual accuracy, clarity, accessibility, rights provenance and whether the activity works in practice. This file remains a review copy until those checks are signed off.

FINISH

My learning reflection

I finished this BrightPencil learning pack.

One thing I understand better now:

A strategy that helped me:

Something I created or noticed:

My next small question or goal:

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