

GRADE 2 LEARNING PACK

Input-Output Machines

Infer a simple operation rule from input-output pairs and test it on new values.

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

Infer a simple operation rule from input-output pairs and test it on new values.

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 a function machine applies the same rule to each input in this activity

2 multiple pairs help identify the rule

3 checking with a new input tests the rule

Talk about it

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

Inputs 2,4,6 give outputs 5,7,9: find the rule.

Apply “double then add 1” to 3,5,8.

Find an incorrect output in a +7 table.

Invent three pairs for a -4 machine.

Explain why one input-output pair may not identify a unique rule.

Try it beyond the page

Real-world / hands-on connection

Use cards, counters, drawings or movement to model at least one puzzle before solving only in your head.

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 paper function-machine puzzle with five pairs and a hidden rule.

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

CHALLENGE

Think deeper

1. Which strategy reduced the possibilities?

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 “Input-Output Machines”.

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 a relevant strategy such as table, elimination, drawing, physical model or working backwards.

2. Suggested response

Check every rule/condition against the solution.

3. Suggested response

When the current approach is confusing, inefficient or not producing progress.

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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