

Trials

Six things to test properly – and one rule: do it more than once

THIS BOOK BELONGS TO

Colour a badge in each time you finish a trial



The Hundred Square

Sheets 16–20



Cut It and Slide It

Sheets 21–25



What Rust Needs

Sheets 26–30



Twenty Flips

Sheets 31–35



Three That Disagree

Sheets 36–40



Who Do I Phone?

Sheets 41–45

Grade 4 asked you to find out. Grade 5 asks you to prove it. Every trial in this book follows the same four steps: **predict** before you touch anything, **test** it once, **repeat** the test — because one result is a fluke, not evidence — and then **explain** why it came out the way it did. That last step is the whole point.

Why these six. Each one attacks something Grade 5 leans on heavily, and settles it physically rather than by explanation. The Hundred Square ends the 0.7 / 0.70 / 0.07 confusion and builds percents on top of it. Cut It and Slide It derives the area formulas instead of handing them over. What Rust Needs teaches the fair test with the repeated trials Grade 5 now expects. Twenty Flips separates probability from outcome. Three That Disagree is synthesis — the year’s hardest reading job. Who Do I Phone? runs Social Studies and the money strand together, because they’re the same lesson.

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Equivalent fractions, fast

Whatever you do to the top, do to the bottom. That's the whole rule — but you have to do it to both.

complete

check

Worked example

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{6}{12}$$

Each time, the top and bottom were multiplied by the same number. The amount never changed.

Start	x2	x3	x4	x6
$\frac{1}{2}$				
$\frac{1}{3}$				
$\frac{2}{3}$				
$\frac{3}{4}$				

Now fill the gap.

$$\frac{2}{3} = \frac{\quad}{12}$$

$$\frac{3}{4} = \frac{9}{\quad}$$

$$\frac{5}{6} = \frac{\quad}{12}$$

$$\frac{1}{4} = \frac{\quad}{8}$$

Which fractions can be written in twelfths? Try halves, thirds, fourths, sixths — and then try fifths. What goes wrong with fifths?



Adding when the bottoms match

The bottom number says how big each piece is. Adding doesn't change the piece size — so it doesn't change the bottom.

7 count pieces

add

$$3/8 + 2/8 = \dots\dots\dots$$

$$5/12 + 4/12 = \dots\dots\dots$$

$$7/10 - 3/10 = \dots\dots\dots$$

$$5/6 - 1/6 = \dots\dots\dots$$

$$3/4 + 3/4 = \dots\dots\dots$$

$$9/12 - 5/12 = \dots\dots\dots$$

One of those goes past one. Find it, and write it as a mixed number too.

Somebody writes $3/8 + 2/8 = 5/16$. Explain what they've misunderstood, using the words *piece* and *size*.

Multiplying and dividing by a unit fraction.

$$3 \div 1/4 = \dots\dots\dots \quad 8 \times 1/4 = \dots\dots\dots$$

One of those got bigger. Why?



Two ways, one answer

Draw the four rectangles first. Then do it in columns. The same four numbers turn up in both.



area model



columns

👁 24×36 split into $(20 + 4) \times (30 + 6)$

x	30	6
20	600	120
4	120	24

$$600 + 120 + 120 + 24 = 864$$

$$32 \times 24$$

x		

=

$$47 \times 15$$

x		

=

Find them hiding. Do 32×24 again in columns. Then point at where each of your four rectangle answers appears in the column working.



Putting a number in

Evaluating means swapping the letter for a number and working it out. Grade 9 asks this in the same words.

substitute

calculate

If $n = 7$, what is $3n + 4$?

$$3 \times 7 + 4 = 21 + 4 = 25$$

$3n$ means $3 \times n$. The multiplication sign is left out on purpose.

Expression	$n = 3$	$n = 5$	$n = 10$
$n + 8$			
$4n$			
$2n + 6$			
$5n - 3$			

Now solve, then check by putting it back in.

$$n + 37 = 82 \rightarrow n = \dots\dots\dots$$

$$6n = 84 \rightarrow n = \dots\dots\dots$$

$$n - 24 = 51 \rightarrow n = \dots\dots\dots$$

$$3n + 5 = 32 \rightarrow n = \dots\dots\dots$$

Which expression grows fastest as n gets bigger? Look at your table and say how you can tell.



Naming triangles twice

Every triangle has two names — one for its sides, one for its angles.

measure

name

Two lists

By sides: equilateral (three equal) · isosceles (two equal) · scalene (none equal)
By angles: acute (all under 90°) · right (one is 90°) · obtuse (one is over 90°)

Sides	Angles	By sides	By angles
5, 5, 5	60, 60, 60		
6, 6, 8	70, 70, 40		
3, 4, 5	37, 53, 90		
5, 5, 9	25, 25, 130		

Try to draw a triangle with two right angles. Go on. Then write down why it can't be done.

The angles always total 180°. Two angles are 55° and 80°. What's the third?



Reading the protractor properly

It has two scales running opposite ways. The fix isn't being careful — it's estimating first.

estimate

measure

The rule that prevents every mistake

Decide acute or obtuse before you read anything. If it's acute the answer must be under 90 — so if you read 130, you're on the wrong scale. Look at the other number.

45°

half a right angle

90°

a square corner

135°

one and a half

180°

a straight line

Draw four angles below. Swap with somebody and measure each other's.

Angle	Acute or obtuse?	My estimate	Measured
A			
B			
C			
D			

Grown-ups: the expectation says *explain how protractors work* , not just use one. Ask why there are two sets of numbers. **E2.3 · E2.4**



When the mean describes nobody

Mean, median and mode all try to say "typical" with one number. They don't always agree, and the disagreement is the interesting bit.

7 work out

argue

Set A: 6, 8, 7, 8, 6, 8, 4

mean

median

mode

Six people's monthly earnings:

\$1800 · \$1900 · \$2000 · \$2000 · \$2100 · \$40 000

Mean Median

Which one describes these six people better, and why?

This is why news reports quote the median for income. A mean that describes nobody isn't much use.



Break the word, find the meaning

You don't sound long words out any more. You break them into parts that mean something.

split

define

inconceivable

in + conceive + able

not + imagine + able to be = not able to be imagined.

Word	Split it	So it must mean
transportation		
irreplaceable		
reconstruction		
disagreement		

Two roots worth owning

port = carry → transport, portable, export, porter, support

struct = build → structure, construct, instruction, obstruct

Pick a root and build the family. Try *spect* (look) or *dict* (say). How many can you find in five minutes?

Grown-ups: this move unlocks subject vocabulary in every subject for the rest of school. Ten minutes on one root beats a spelling list.

Language B2.1



Three short sentences, one good one

Sentence combining is the fastest way to make writing sound grown-up.

 combine

 read it back

Three into one

It was raining. We went to the park. We stayed until dark.

Although it was raining, we went to the park, and we stayed until dark.

Two main clauses plus a dependent one — that's a compound-complex sentence.

1. The dog barked. The postman arrived. Nobody answered.

2. The ice melted. The temperature rose. The experiment restarted.

Now repair these. One is a fragment, one is a run-on. Mark which, then fix both.

Because the bus was late.

We ran to school we were still late the door was shut.

Grown-ups: children can say compound-complex sentences long before they write them. Combining gets what they can say onto the page.

Language B3.1



Être, avoir, et les questions

Two verbs and six question words do most of the work in a second year of French.

dis-le

écris

ÊTRE – to be

je	suis
tu	
il / elle	est
nous	
vous	êtes
ils / elles	

AVOIR – to have

j'	ai
tu	as
il / elle	
nous	avons
vous	
ils / elles	ont

Relie les questions.

Qui ?

Où ?

Quand ?

Pourquoi ?

Where?

Why?

Who?

When?

Écris trois phrases vraies sur toi. Je m'appelle... J'ai dix ans. J'aime...

Grown-ups: year two is where the grammar starts and the novelty wears off. Volume beats accuracy — a child willing to sound silly will outrun a careful one.

FSL B1 · A2 · D1



Five systems, one body

The big idea this year is that they never work alone.

label

connect

System	What it does	Two parts
Digestive		
Respiratory		
Circulatory		
Musculoskeletal		
Nervous		

You run upstairs. Put the five systems in the order they get involved, and say what each does.

Watch out for heart diagrams. They're drawn as if you're facing the person, so the heart's **left** side appears on the **right** of the page.



Squash, stretch, slide, twist

Four internal forces. Feel each one on a sponge before you write anything.

 feel it

 name it

Compression

squashing

Tension

stretching

Shear

sliding apart

Torsion

twisting

What's happening	Which force?
A table leg holding a heavy load	
A tug-of-war rope	
Wringing out a wet towel	
Scissors cutting paper	
A guy rope holding a tent	

Static or dynamic? A bridge holds its own weight all day (static). A hundred people walking in step is dynamic. Give one more example of each.

Count the triangles. Bridges, roofs, cranes, pylons, bicycle frames. Why triangles and not squares?



Six steps for a hard moment

A script for when instinct isn't enough. The same six steps every time.

 reason

 decide

The situation. Someone in a group chat is being unkind about a person who isn't in it. Two people have joined in. One has said nothing. Everyone can see you're online.

1. What could go wrong?

2. What could I do? Three options, not one.

3. What would happen after each?

4. Is this too big to handle alone? Who would I tell?

5. What I'd actually do

6. How would I know afterwards if it worked?

Telling isn't tattling. Tattling tries to get somebody in trouble. Telling tries to keep somebody safe.



Where does your eye go first?

Emphasis was the Grade 4 principle of design — deciding what gets looked at first, on purpose. Grade 5's own focus is **proportion**, and this warm-up keeps the Grade 4 idea sharp because the two work together.

notice

make it

Five ways to create emphasis

Make it bigger · give it empty space around it · use a contrasting colour · point lines towards it · make everything else quiet

The same simple drawing, three times. Change only how the emphasis is made.



by size



by colour



by empty space

Find it in the wild. Look at an advert or a film poster. Where does your eye go first, and what did the designer do to send it there?

Grown-ups: the progression is
contrast → repetition →
variety →

emphasis (Gr 4) → proportion (Gr 5) → balance. Emphasis is a decision rather than a technique; Grade 5's focus is proportion, so this sheet is deliberate revision.

Arts D1 · D2



TRIAL ONE

The Hundred Square

Five sheets · you need coloured pencils, a metre stick, and some coins

Everyone believes 0.07 is bigger than 0.7 at some point, because 7 is bigger than 07 has more digits. You cannot argue somebody out of it. You shade it.

Predict

Write down which is bigger before you shade anything

Test

Shade both on a hundred square and see

Repeat

Do it four more times with different pairs

Explain

Say why, using the words tenths and hundredths

Extend

Turn every one into a percent, and find them in real life

A warning. The prediction usually goes wrong the first time. Do not fix it by explaining. Shade the square and let the answer be obvious.

Grown-ups: hundredths are new this year, and they resurrect last year's tenths confusion in a harder form. The grid is the only thing that settles it. **B1.5 · B1.7 · B2.3**



1

BEFORE YOU SHADE ANYTHING

You will not be allowed to change this later. Being wrong here is genuinely useful.

 predict

Which is bigger?	My prediction	Why I think so
0.7 or 0.07		
0.7 or 0.70		
0.25 or 0.3		
0.4 or 0.19		
1.05 or 1.5		

The rule I think I'm using. Write down how you're deciding — even if you're not sure it's right.

Now close this page. Do not look at it again until sheet 19.

Grown-ups: the value is in the prediction being written and then fixed. A prediction you can quietly revise teaches nothing.

B1.5



2

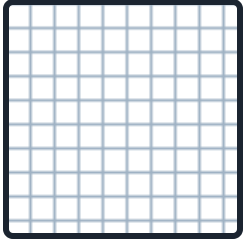
SHADE IT AND SEE

One square, a hundred pieces

Every big square below is one whole, cut into a hundred. Shade each amount, then write it three ways.

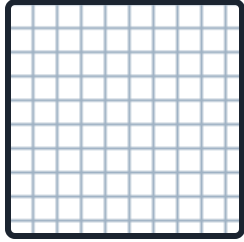
shade

three ways



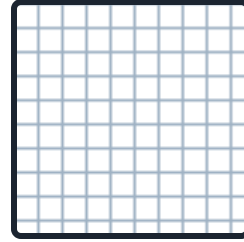
shade 0.7

...../100%



shade 0.07

...../100%

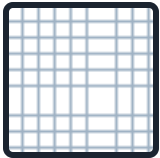


shade 0.70

...../100%

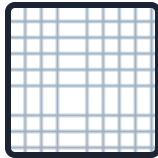
3

ONCE ISN'T EVIDENCE



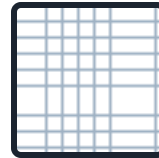
0.25 vs 0.3

bigger:



0.4 vs 0.19

bigger:



1.05 vs 1.5

bigger:

Two of the first three are exactly equal. Which two, and how does the shading prove it?



4

NOW SAY WHY

Go back and check your prediction

Open sheet 17. Compare what you wrote with what the squares showed.

✓ compare explain

Pair	I predicted	It was actually	Right?
0.7 / 0.07			
0.7 / 0.70			
0.25 / 0.3			
0.4 / 0.19			
1.05 / 1.5			

The explanation. Finish this, using the words *tenths* and *hundredths*:

"The first digit after the point counts..."

So the rule I wrote on sheet 17 was ☐ right ☐ not quite. If not quite, what's the correct rule?

Explaining is the assessment. Getting it right by luck and getting it right because you understand look identical until somebody asks why.



5

THE SAME THING, THREE WAYS

Fraction, decimal, percent

Money already does this and you already believe it. A quarter is 25¢, 25/100, 0.25 and 25%.

convert

go and find it

Fraction	Decimal	Percent	In money
1/2			50¢
1/4			
	0.1		
3/4			
		1%	

The bridge

Percent means "out of a hundred." Get the fraction into hundredths, and the percent is just the top number.

Go and find five percents in the real world. A sale sign, a battery icon, a nutrition panel, a weather app, a receipt. Write each one three ways.

Where I found it	Percent	Decimal	Fraction

Badge earned. Colour the first badge on the cover.

Grown-ups: 'B1.7' is the keystone of Grade 5 number work. Money is where children already accept the equivalence — start there and generalise outward.

B1.7



TRIAL TWO



Cut It and Slide It

Five sheets · you need scissors, squared paper, a ruler and a pencil

Two formulas arrive this year. Nobody should tell you either of them. You are going to cut them out of paper and discover them yourself — and formulas you find that way are the ones you remember.

Predict

Guess the area of a parallelogram before you cut anything

Test

Slice the end off, slide it round, and see what it becomes

Repeat

Do it with three different parallelograms

Explain

Write the formula, and say why the slanted side never mattered

Extend

Cut a rectangle in half and find the triangle formula too

The height is the perpendicular height — straight up from the base, at a right angle. Not the slanted side. This is the single most reliable mistake in Grade 5 area work, and the cutting is what prevents it.

Grown-ups: the expectation says *use the area relationships to develop the formulas*

— developing, not receiving. This trial is that expectation, done literally.

E2.5 · E2.6



1

GUESS BEFORE YOU CUT

How much space does it cover?

Draw a parallelogram on squared paper with a base of 8 squares and a perpendicular height of 5. Guess its area before you count anything.

 draw predict

My prediction

Area = squares

How I worked it out:

.....
.....

Now count the squares. Count whole ones, then pair up the part-squares.

Counted = squares

Was your prediction close?

.....
.....

A guess worth testing. Somebody says: "the area must be the base times the slanted side." Write down whether you agree, and why. You'll check it on the next sheet.

.....
.....
.....
.....
.....



2

CUT, SLIDE, LOOK

It turns into a rectangle

Cut your parallelogram out. Slice straight down from the top corner. Slide the triangle you cut off round to the other end.

cut slide

Before — stick the parallelogram here



After — stick the rearranged one here



It became a _____, with base _____ and height _____.

3

THREE TIMES, NOT ONCE

Parallelogram	Base	Perpendicular height	Slanted side	Area after cutting
1				
2				
3				

Look down your table. Which two columns multiply together to give the last one? And which column never came into it at all?

Grown-ups: the slanted-side column exists purely so it can be seen to be irrelevant. Three trials is what makes that visible rather than asserted. **E2.5 · A1**



4

WRITE THE FORMULA YOU FOUND

You just proved something

Nobody told you this. You cut it out of paper three times and it came out the same way every time. That's a proof.

 state it justify

Area of a parallelogram =

..... ×

Why the slanted side never mattered. Explain it as if to somebody who wasn't here.

Was your prediction on sheet 22 right? And what about the "base × slanted side" idea — was that person right or wrong, and how do you know now?

A very stretched parallelogram. Imagine one leaning so far over that the height is tiny. Does the formula still work? Draw it and check.



5

ONE MORE CUT

And now the triangle

Cut any rectangle along its diagonal. Look at the two pieces.

✂ cut

✎ state it

Stick both halves here



Are they the same size? ☐ yes ☐ no

Area of a triangle =

..... × ÷

Because a triangle is exactly...
.....
.....

Shape	Base	Height	Area
rectangle	8 cm	5 cm	
parallelogram	8 cm	5 cm	
triangle	8 cm	5 cm	
triangle	12 cm		30 cm ²

Same area, different fence. Twelve square tiles make three different rectangles. Work out the perimeter of each — 1×12, 2×6, 3×4. Which has the smallest fence?

.....
.....
.....

Badge earned. Colour the second badge on the cover.

Grown-ups: the first three rows are deliberately identical in base and height — so the relationship between the three formulas is visible at a glance. E2.5 · E2.6



TRIAL THREE

What Rust Needs

Five sheets · you need four iron nails, four jars, water, cooking oil — and two weeks

Grade 4 asked for a fair test. Grade 5 adds one word: **repeated**. One result is a fluke. Several results start to be evidence, and that difference is the whole of this trial.

Predict

Say what you think rust needs, before you set anything up

Test

Four jars, one thing different in each

Repeat

Run the whole thing twice, side by side

Explain

Say what rust needs, and whether it's a chemical change

Extend

Sort a pile of everyday changes into physical and chemical

This one takes two weeks. Set it up, then leave it alone. Checking it every day is fine; moving the jars is not.

Grown-ups: the Grade 5 standard is identifying the variable changed, the ones held constant, and running repeats.
This trial is built around exactly that.

Science A1 · C1 · C2



1

BEFORE YOU TOUCH A JAR

What do you think rust needs?

Circle everything you think is needed, then write why. You cannot change this afterwards.

predict

set up

water

yes / no

air

yes / no

warmth

yes / no

light

yes / no

Why I think so:

2

FOUR JARS, ONE DIFFERENCE EACH

Jar	What's in it	Has water?	Has air?
1	nail in water, open to the air	yes	yes
2	nail covered in cooking oil	no	no
3	dry nail, open to the air	no	yes
4	nail in boiled, cooled water, sealed tight	yes	no

What am I keeping the same in all four? Same kind of nail, same size jar, same place in the room, same start day. Add anything else you thought of:

Boiling the water drives the dissolved air out of it. That's what makes jar 4 different from jar 1.

Grown-ups: jar 4 is the clever one and worth explaining — it isolates water without air, which no other jar does.

Science A1 · C2



3

TWICE, NOT ONCE

Two weeks of watching

Set up a second identical set of four jars. Record both, every few days. Where the two sets agree, you have something.

observe

record

Set A

Jar	Day 3	Day 7	Day 10	Day 14
1				
2				
3				
4				

Set B — the repeat

Jar	Day 3	Day 7	Day 10	Day 14
1				
2				
3				
4				

Did your two sets agree? If any jar behaved differently in Set B, say which — and suggest why that might have happened.

Grown-ups: disagreement between the sets is not a failed experiment — it's the most instructive outcome, because it forces a hunt for the uncontrolled variable. Science A1



4

WHAT DID YOU FIND OUT?

So rust needs...

Go back to sheet 27 and check your prediction against what actually happened.

✓ compare

conclude

I predicted rust needs:

It actually needs:

How each jar proves it. Which jar rules out warmth? Which one rules out light?

Physical or chemical? Is rusting a physical change or a chemical one? Give two reasons using the signs you know.

Could you get the iron back? Explain why that's a hard question — and what "irreversible" actually means.

Now use it. Bikes, gates, tools, cars. Name two things people do to stop iron rusting, and say which of rust's two requirements each one removes.



5

DID A NEW SUBSTANCE APPEAR?

Sorting every change you meet

That's the only question. If a new substance was made, it's chemical. If it's still the same stuff, it's physical.

sort

justify

What happens	Physical or chemical?	How do you know?
Ice melting		
Wood burning		
Sugar dissolving in water		
An iron nail rusting		
Baking a cake		
Milk going sour		



Signs of a chemical change

a colour change · a gas produced · heat or light given off · a new smell · a solid appearing when two liquids mix

The one everybody argues about. Sugar dissolving looks like it vanished. Design a test that proves the sugar is still there, and describe what you'd expect to see.

Badge earned. Colour the third badge on the cover.



TRIAL FOUR

Twenty Flips

Five sheets · you need a coin, a die, and a few willing people

A half chance does not mean ten heads in twenty flips. Almost everybody thinks it does. This trial is the cheapest way to find out that it doesn't.

Predict

Write down exactly how many heads you expect

Test

Flip twenty times and tally

Repeat

Do it five times, and pool the whole class if you can

Explain

Say what a probability of $\frac{1}{2}$ actually promises

Extend

Ask a different group and see whether the averages move

The result you're hoping for is a messy one. If your first twenty flips come out exactly ten-ten, do it again — the point is to see the wobble.

Grown-ups: the gap between probability and outcome is the most useful idea in the strand, and it can only be taught by doing it. D2.1 · D2.2 · D1.1



1

COMMIT TO A NUMBER

How many heads?

Write your prediction first. Then flip twenty times and tally honestly, including the ones you didn't expect.

predict

tally

Before flipping: in twenty flips of a fair coin, I expect exactly heads.

How sure are you? ☐ certain ☐ fairly sure ☐ just guessing

2

TWENTY FLIPS

	Tally	Total	As a fraction of 20
Heads			
Tails			

Did you get exactly what you predicted?

☐ yes ☐ no — I was out by

Does that mean the coin is unfair? Write what you think, before the next sheet.

.....

Write your probability as a fraction: the chance of heads is, and on a 0-to-1 line it sits

.....



3

ONE RUN TELLS YOU NOTHING

Five runs, then a hundred

Run the twenty flips five times over. Then pool everybody's results if you can — a whole class gets you into the hundreds.

7 repeat

graph it

Run	1	2	3	4	5	Total
Heads						
Flips	20	20	20	20	20	100

Across all 100 flips

Heads: out of 100

As a percent: %

How far from 50%?

Pooled with the class

Heads: out of

As a percent: %

How far from 50%?

The pattern. Look at your single run, your 100, and the class total. What happens to the distance from 50% as the number of flips grows?

That's the whole idea. Probability doesn't promise anything about twenty flips. It promises something about a very large number of them.

Grown-ups: seeing the percentage tighten toward 50 as the sample grows is the concrete version of the law of large numbers, and children find it genuinely surprising.

D2.1 • D1.1



4

WHAT DOES $\frac{1}{2}$ ACTUALLY PROMISE?

Say it properly

Go back to sheet 32. You predicted a number. Now write what you'd predict instead, knowing what you know.

explain write

Finish the sentence. "A probability of one half means..."

Somebody flips 20 times and gets 13 heads. They say the coin must be weighted. What would you say back?

Write each chance as a fraction.

Event	As a fraction	Where on the 0–1 line?
A die shows a 3		
A die shows an even number		
A die shows less than 7		
Picking red from 3 red and 5 blue		

How many times would you have to flip before you'd start to believe a coin really was unfair? There's no single right answer — but say a number, and say why.



5

ASK A DIFFERENT GROUP

Would another class agree?

Collect some real data twice, from two different groups. Predict first whether the averages will match.

predict

7

collect

My question (something countable — books read last month, hours of sport, pets at home):

Predict. Will the two groups give the same mean, median and mode?

all three the same • some the same • none the same

Group 1 — ten people

mean median mode

Group 2 — a different ten

mean median mode

Were you right? And a harder one — was *either* group a fair sample of everybody? Who did you leave out?

Badge earned. Colour the fourth badge on the cover.



TRIAL FIVE

Three That Disagree

Five sheets · you need a library, a device, and something you actually want to know

Grade 4 asked whether to believe one source. Grade 5 asks a much harder question: what do you think, having read three that don't agree?

Predict

Write what you already believe about your question

Test

Find three sources and record what each actually says

Repeat

Check each one — who made it, and what did they want?

Explain

Say what you think now, and what changed your mind

Extend

Write it up in your own words, with the sources named

Pick something you genuinely don't know the answer to. If you already know how it comes out, this trial can't teach you anything.

Grown-ups: this is the year's hardest reading job — synthesis across disagreeing sources. Grade 6 research assignments assume it.

Language C2 · C3 · D1

1

WHAT DO YOU ALREADY THINK?

Write it before you look

Everybody starts with an opinion. Writing it down first is what lets you notice if it changes.

 predict

 research

My question:

What I already think, before reading anything:

Where did that idea come from?

2

FIND THREE

Source	What kind it is	What it says
1		
2		
3		

Try to make them genuinely different kinds — a book, a website, a video, a person you can ask.

Grown-ups: "where did that idea come from" is worth pressing on. Most first opinions come from one overheard remark.

Language D1 · C3



3

CHECK EACH ONE

Who made it, and what did they want?

Same two questions for every source. Ask them properly and most of critical reading is done.

 interrogate judge

	Source 1	Source 2	Source 3
Who made it?			
Why did they make it?			
Do they say where their facts came from?			
Is anybody paying for it?			
How much do I trust it, 1 to 5?			

All three agree on...

They disagree about...

Whose voice is missing from all three? Somebody always is.

Grown-ups: the trust rating forces a judgement rather than a shrug — and the reason behind the number matters more than the number.

Language C3



4

WHAT DO YOU THINK NOW?

Did anything change your mind?

Go back to sheet 37 and read what you wrote before you started.

☒ compare☐ decide

What I think now:

Did it change?

- ☐ completely
☐ a bit
☐ not at all

What convinced you — and which source did it?

The honest bit. If nothing changed your mind, was that because the evidence backed you up — or because you weren't really willing to be wrong?

Changing your mind because of evidence is not losing. It's the entire point of finding evidence.

Grown-ups: the "weren't really willing to be wrong" question is unusually direct, and worth talking through rather than leaving as writing.

Language C3 · D2



5

WRITE IT UP

In your own words, with the sources named

This is new in Grade 5. Where the work came from now has to be stated, not just reworded.

write

check



The move that stops you copying

Read it. Close the book. Say it out loud in your own words. Then write. Closing the book is the part that matters — you cannot copy what you cannot see.

My answer, in a paragraph

Where I got it from

Check yourself. ☐ Nothing here is copied word for word ☐ I've said where each fact came from ☐
I've said what I think, not just what they said

Badge earned. Colour the fifth badge on the cover.



TRIAL SIX

Who Do I Phone?

Five sheets · you need a real local problem, and a stamp or an email address

Three levels of government, three sets of jobs. Most adults cannot sort them reliably — which is why a child who can has something genuinely useful.

Predict

Guess which level handles each of ten everyday things

Test

Look them up and see how many you got right

Repeat

Follow the money — which tax pays for which service

Explain

Pick a real local issue and work out who's responsible

Extend

Write to them. Actually send it.

This one runs into maths. Sheet 48 of the maths book asks which level collects which tax. It's the same lesson from the other side — do them in the same week if you can.

Grown-ups: 'B1' asks for a plan of action, not just knowledge of how government works. The letter at the end is the expectation, done properly.

SS B1 · B2 · B3 · Math F1.6



1

GUESS FIRST

Ten things, three levels

Fill the middle column from memory, without looking anything up. Then check.

predict check

The thing	My guess	Actually	✓
A pothole outside your house			
Getting a passport			
How long the hospital wait is			
What gets taught in school			
Rubbish collection day			
The army			
The library's opening hours			
The speed limit on a provincial highway			
The postal service			
Whether a new park gets built near you			

I got

out of 10

Which ones surprised you?

Ask an adult to try it too — without seeing your answers. Compare scores. Most adults score around six.

Grown-ups: genuinely worth attempting yourself before looking. The surprise is usually education, which is provincial rather than local. SS B3



3

FOLLOW THE MONEY

Who collects it, and what does it buy?

Every service is paid for by a tax. Match them up, then look at a real receipt.

match

find a receipt

Tax	Who collects it	Name one thing it pays for
Income tax		
Sales tax (HST)		
Property tax		

Find a real receipt. In Ontario the sales tax is 13%. Check the maths.

Subtotal Tax shown Total

Work out 13% of the subtotal yourself: Does it match?

Were any lines not taxed? Which ones, and why do you think that is?

First Nations governance doesn't fit this model. Band councils, self-government and treaty relationships work differently — and aren't meant to fit into three levels. Find out one thing about how a nation near you governs itself.

Grown-ups: basic groceries in Ontario are mostly untaxed, which is a deliberate policy choice and a good conversation.

SS B3 · Math F1.2 · F1.6



4

A REAL PROBLEM

Something you'd actually change

Choose something local and real — a crossing, a park, a bus route, a bin, a bit of pavement. Not a national issue.

investigate

plan

The issue:

Which level is responsible? How do you know?

Who cares about this	What they want	Do they agree with you?

My plan of action.

What the government should do:

What it would cost, roughly:

What citizens could do:

Somebody will disagree with you. Who, and what's their best argument? Write it down before you write your letter — you'll need to answer it.

Grown-ups: anticipating the strongest objection is `B2`'s perspective expectation and Language `B1` together. It also makes the letter far better.

SS B1 · B2



5

ACTUALLY SEND IT

Write to them

A reply that arrives is worth a term of lessons. Most councillors and MPPs do answer letters from children.

draft

send

Who I'm writing to: Their job title:

What a good letter has

1. Who you are and where you live 2. The problem, in one sentence 3. Why it matters, with something specific 4. What you'd like them to do 5. A thank you, and how to reply to you

My draft

Before sending: ☐ polite ☐ specific ☐ asks for something clear ☐ checked by an adult

Sent on Reply received

Badge earned. Colour the last badge. That's all six trials finished.

Grown-ups: please do send it. The gap between "we studied government" and "I wrote to my councillor and she replied" is the whole difference.

SS B1 · Language D1 · D3



Five games worth keeping

All five need almost nothing, and all five practise something Grade 5 leans on.

Percent Snap

Write fractions on half the cards, decimals and percents on the rest. Turn them over one at a time. Snap when two mean the same amount — $\frac{3}{4}$, 0.75 and 75%.

Practises: B1.7

Twelve Hunt

Deal cards 1 to 12. One player names a product — say 84. The other finds both factors before you count slowly to ten. Swap over.

Practises: B2.2, and the 11s and 12s

Guess My Angle

One player draws an angle. The other estimates it, then measures. Score the difference — lowest total after ten rounds wins.

Practises: E2.3, E2.4

Which Level?

Call out something a government does. Everyone points — up for federal, sideways for provincial, down for municipal. Wrong pointers sit out a round.

Practises: Social Studies B3

Beat the Till

In a shop, estimate the total including 13% tax before you reach the till. Closest guess wins. Play it every time you shop.

Practises: F1.2, F1.5

House rule

Only Twelve Hunt is timed, and even that counts slowly and out loud. If a game stops being fun, stop playing it.



Number benders

Nothing here needs anything you haven't been taught. All of it needs you to think for a minute first.

1. A triangle has an area of 24 cm^2 . Give three different base-and-height pairs it could have.

2. I am a decimal between 0.4 and 0.5. I round to 0.5. What could I be? Give two answers.

3. $\frac{3}{8}$ of a class of 32 walk to school. How many walk? What percent is that?

4. Five numbers have a mean of 8. Four of them are 5, 7, 9 and 11. What's the fifth?

5. A shop sells 3 pens for \$2. How much for 12? How many pens can you buy with \$10?

6. If $n = 6$, which is bigger: $4n - 5$ or $2n + 8$? What about when $n = 20$?

7. 431 pencils shared between 12 classes. How many each, and how many left? Now share 431 metres of ribbon instead.

8. The hard one. A \$60 coat has 25% off. Then 13% tax is added to the sale price. What do you pay? Is that more or less than \$60?

Grown-ups: number 8 is percent decrease then percent increase — the answer surprises people, and it's exactly the reasoning 'F1.2' wants. Answers on sheet 51.

B1.7 · B2.5 · B2.7 · C2.2 · D1.5 · E2.5 · F1.2



Word and world benders

Same idea, other subjects. Several have more than one good answer.

1. Build three words from the root *dict* (say). What does each one mean?

2. Turn these into one compound-complex sentence: *The bell rang. We hadn't finished. The teacher let us stay.*

3. Punctuate: *bring the following a pencil a ruler and your book*

4. Two headlines describe one protest: *concerned residents* and *angry mob*. What has each writer done?

5. Sugar dissolves and disappears. Why is that still a physical change?

6. Why do soldiers break step when crossing a bridge?

7. An elder's spoken account of an event is a primary source. Explain why.

8. The hard one. A graph shows sales rising steeply. The vertical axis starts at 48 and ends at 52. What's actually going on — and why would somebody draw it that way?

Grown-ups: number 8 is 'D1.6' in one question, and it's the skill that matters most in a world of infinite charts.

Language B2.1 · B3.1 · C3 · Science C2 · D2 · SS A2 · Math D1.6



Twelve things to go and do

None of these is homework. All of them do more for Grade 5 than a worksheet would.

- | | |
|--|--|
| ☐ Estimate the shopping total with tax before you reach the till. Every time. | ☐ Find the unit price on three shelf labels and work out which is best value. |
| ☐ Halve a recipe. Then scale it for 18 when it serves 12. | ☐ Check where the vertical axis starts on any graph in the news. |
| ☐ Watch fifteen minutes of a municipal council meeting. Most are streamed. | ☐ Take a pulse before and after running up the stairs. Graph it. |
| ☐ Find whose traditional territory you live on, and read about that nation. | ☐ Measure a room and work out its area — then its perimeter. |
| ☐ Read the French side of everything for a week. | ☐ Look at distant hills on a clear day. Are they really paler and bluer? |
| ☐ Learn a round and sing it in three parts with two other people. | ☐ Ask an adult which level of government does what. Keep score. |

Add three of your own — things you actually want to do that connect to something in this book.

Grown-ups: the unit-price one is the highest-value habit here. Most adults have never looked at the small print on a shelf label.

All subjects



What Grade 5 Health covers

This year Health names things Grade 4 didn't. Reading it in advance means nothing arrives as a surprise.

What's in it. The parts of the reproductive system, and how the body changes during puberty. The processes of **menstruation** and **spermatogenesis**, and how they relate to reproduction and growing up. And the **emotional and interpersonal** side — mood, changing friendships, comparison, feeling early or feeling late.

Normal changes. Tick any you already knew about.

- ☐ getting taller, sometimes fast
- ☐ body hair growing
- ☐ voices changing
- ☐ more body odour
- ☐ oilier skin and spots
- ☐ breasts developing
- ☐ moods going up and down

The timing bit.

Everyone starts at a different age, and all of it is normal. The first person in a class and the last person both find it hard, and neither of them chose it.

Feelings go up and down too. Talking to somebody helps, and that isn't a sign anything has gone wrong.

Two or three people I could talk to. Write them down now, on an ordinary day, so the list already exists when you need it.

In Canada, Kids Help Phone is free at any hour: **1-800-668-6868**, or text **CONNECT** to **686868**.

Answers — warm-ups and puzzles

Only the questions with one right answer are here. The trials are judged on the reasoning, not the result.

Sheet 2. $1/2 \rightarrow 2/4, 3/6, 4/8, 6/12 \cdot 1/3 \rightarrow 2/6, 3/9, 4/12, 6/18 \cdot 2/3 \rightarrow 4/6, 6/9, 8/12, 12/18 \cdot 3/4 \rightarrow 6/8, 9/12, 12/16, 18/24$.
Gaps: $8/12 \cdot 12 \cdot 10/12 \cdot 2/8$. Fifths don't work in twelfths because 5 doesn't divide into 12.

Sheet 3. $5/8 \cdot 9/12 \cdot 4/10 \cdot 4/6 \cdot 6/4 (= 1\frac{1}{2}, \text{the one past one}) \cdot 4/12$. Then $3 \div 1/4 = 12$ and $8 \times 1/4 = 2$. Dividing got bigger because you're asking how many quarters fit into 3.

Sheet 4. $32 \times 24 = 600 + 120 + 60 + 48 = \mathbf{768}$. $47 \times 15 = 400 + 200 + 105 + 35 = \mathbf{705}$.

Sheet 5. $n + 8 \rightarrow 11, 13, 18 \cdot 4n \rightarrow 12, 20, 40 \cdot 2n + 6 \rightarrow 12, 16, 26 \cdot 5n - 3 \rightarrow 12, 22, 47$. Solutions: $n = 45, 14, 75, 9$. $5n - 3$ grows fastest — the biggest multiplier wins.

Sheet 6. equilateral/acute · isosceles/acute · scalene/right · isosceles/obtuse. Two right angles is impossible: $90 + 90 = 180$ already, leaving nothing for the third. The missing angle is 45° .

Sheet 8. Set A: mean $47 \div 7 \approx \mathbf{6.7}$, median 7, mode 8. Earnings: mean **\$8300**, median **\$2000**. The median describes them; the mean describes nobody.

Sheet 9. trans+port+ation = the act of carrying across · ir+replace+able = not able to be replaced · re+construct+ion = the act of building again · dis+agree+ment = the state of not agreeing.

Sheet 11. ÊTRE: tu **es**, nous **sommes**, ils **sont**. AVOIR: il **a**, vous **avez**. Qui = who · Où = where · Quand = when · Pourquoi = why.

Sheet 13. table leg — compression · tug-of-war rope — tension · wringing a towel — torsion · scissors — shear · guy rope — tension.

Sheet 25. Rectangle 40 cm^2 · parallelogram 40 cm^2 · triangle 20 cm^2 · missing height 5 cm. Twelve tiles: 1×12 perimeter 26, 2×6 perimeter 16, 3×4 perimeter 14 — the square has the smallest fence.

Sheet 30. Physical: ice melting, sugar dissolving. Chemical: wood burning, rusting, baking, milk souring.

Sheet 42. Municipal: pothole, rubbish, library hours, a new local park. Provincial: hospital waits, school curriculum, provincial highway speed limits. Federal: passport, the army, the postal service.

Sheet 47. **1.** Any pair multiplying to 48, e.g. $8 \times 6, 12 \times 4, 16 \times 3$ (because $\text{area} = b \times h \div 2$). **2.** 0.45 to 0.49 all round to 0.5. **3.** 12 walk, which is 37.5%. **4.** 8 — the five must total 40. **5.** 12 pens cost \$8; \$10 buys 15 pens. **6.** At $n = 6$ they're equal, both 19. At $n = 20, 4n - 5 = 75$ beats $2n + 8 = 48$. **7.** 35 pencils each with 11 left; 35 and $11/12$ metres of ribbon each. **8.** 25% off \$60 leaves \$45. Adding 13% gives **\$50.85** — less than \$60, because the discount was taken from the larger number.

Sheet 48. **3.** Bring the following: a pencil, a ruler and your book. **5.** The sugar is still sugar — evaporate the water and it returns. **6.** Marching in step is a dynamic load that can set a bridge swaying. **7.** It comes from somebody who was there, so it's a first-hand account. **8.** The real change is tiny — about 4 units — but the cut axis makes it look enormous.

The trials have no answer key on purpose. They're judged on whether the prediction was written down, the test was fair, it was repeated, and the explanation holds together. A prediction that turned out wrong, well explained, is worth more than a lucky right one.



What did you actually find out?

Six trials. Look back at your six predictions and be honest about how many were right.

✓ review

✎ reflect

Trial	My prediction was	The thing that surprised me
1 · The Hundred Square		
2 · Cut It and Slide It		
3 · What Rust Needs		
4 · Twenty Flips		
5 · Three That Disagree		
6 · Who Do I Phone?		

predictions I got right

out of 6

Which wrong prediction taught you the most?

The trial I'd do again, differently:

What I'd change about how I did it:

Six out of six right would have been a bad result. If every prediction came true, the questions weren't hard enough — and you didn't learn anything you didn't already know.