1. Estimate and check



Name _____ Class _____ Date _____

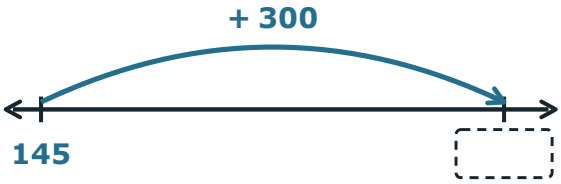
Max and Tim's stop · Canberra · Parliament House. On the green lawn in front of Parliament House in Canberra, a huge flag flies from a steel mast with four legs.

Today: Round the numbers to **estimate** first, then work out the exact answer and **check** it against the estimate.

Warm-up The friendly number is the estimate

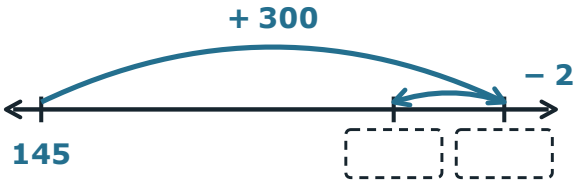
Each answer helps with the next one. Fill in the model, then write the equation.

1 **a)** 145 + 300



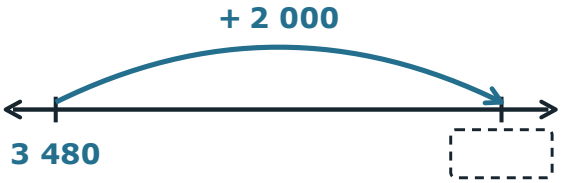
145 + 300 = _____

b) 145 + 298



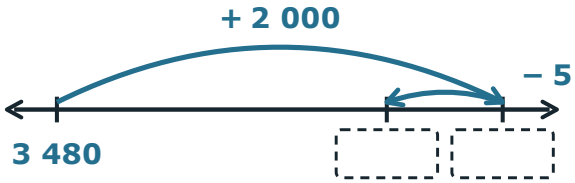
145 + 298 = _____ – 2 = _____

c) 3 480 + 2 000



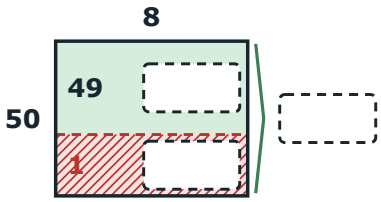
3 480 + 2 000 = _____

d) 3 480 + 1 995



3 480 + 1 995 = _____

e) 8 × 49

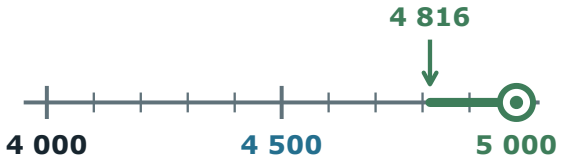


8 × 50 = _____

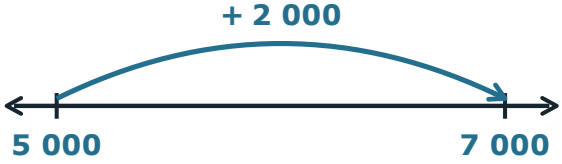
8 × 49 = 8 × 50 – _____ = _____

KNOWLEDGE Estimate first, then check

WORKED EXAMPLE **Round 4 816 to the nearest thousand.**



nearest 1 000: 5 000



1. 4 816 is past the halfway mark, 4 500, so it is nearer to 5 000 than to 4 000: it rounds to **5 000**.
2. The estimate starts at 5 000. 2 190 rounds to 2 000: one friendly jump of **2 000**.
3. 5 000 + 2 000 = **7 000**. The exact answer to 4 816 + 2 190 must be close to 7 000.

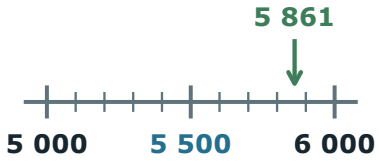
nearest 1 000: 4 816 ≈ 5 000

5 000 + 2 000 = 7 000

Estimate and check

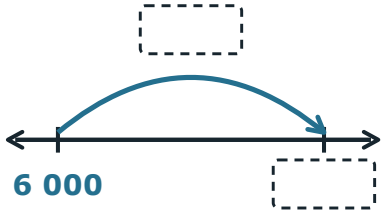
2 ★

a) Round **5 861** to the nearest thousand.



nearest 1 000: 5 861 ≈ _____

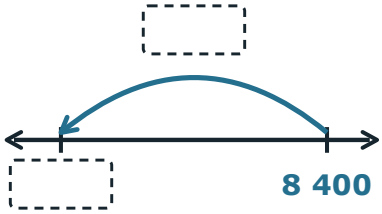
b) So estimate **5 861 + 3 092**: round 3 092 to the nearest thousand too.



6 000 + _____ = _____

3 ★

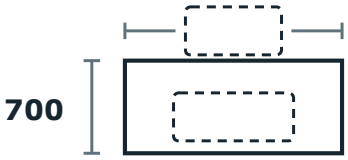
Now estimate **8 412 − 3 276**: round each number to the nearest hundred.



8 400 − _____ = _____

4 ★

Use rounding to estimate **694 × 18**: round 694 to the nearest hundred and 18 to the nearest ten.

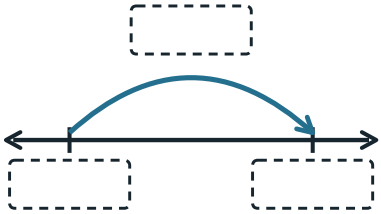


700 × _____ = _____

5 ★

Use rounding to estimate **24 615 + 37 380**: round each number to the nearest thousand.

_____ + _____ = _____



6 ★

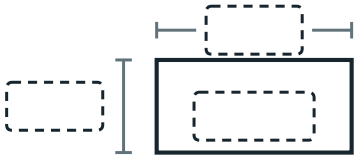
Use rounding to estimate **43 × 208**: round 43 to the nearest ten and 208 to the nearest hundred.

_____ × _____ = _____



7 ★

a) Use rounding to estimate **42 × 306**: round 42 to the nearest ten and 306 to the nearest hundred.



_____ × _____ = _____

b) Is your estimate more or less than the exact product?

- ◯ More: both numbers were rounded up, so it is an overestimate
- ◯ Less: both numbers were rounded down, so it is an underestimate
- ◯ The same: an estimate is exact

8 ★

Max works out 6 425 − 2 998 = 3 427.
Check it with the inverse:
3 427 + 2 998

3 427 + 2 998



3 427 + 2 998 = _____

Estimate and check

9 ★ Tim works out 5 207 − 1 996 = 3 211. **Check it with the inverse: 3 211 + 1 996**

3 211 + 1 996 = _____

3 211 + 1 996

_____ _____

☐ + ☐ = ☐

10 ★ **a)** Estimate **3 897 + 2 456**: round each number to the nearest thousand.

Draw your model

_____ + _____ = _____

b) Now work it out exactly with give and take: make **3 897** a whole thousand. **3 897 + 2 456**

Draw your model

3 897 + 2 456 = _____

11 ★ Estimate **812 × 39**: round 812 to the nearest hundred and 39 to the nearest ten.

812 × 39 ≈ _____ × _____ = _____

Draw your model

12 ★ Tim works out 7 204 − 3 995 = 3 209. Check it with give and take: make 3 995 a whole thousand. **3 209 + 3 995**

Draw your model

3 209 + 3 995 = _____

13 ★ Estimate **61 384 − 28 920**: round each number to the nearest thousand.

Draw your model

_____ − _____ = _____

14 ★ Estimate **58 × 412**: round 58 to the nearest ten and 412 to the nearest hundred.

58 × 412 ≈ _____ × _____ = _____

Draw your model

Estimate and check

APPLICATION **At Parliament House** Choose a model and draw it, then complete the equation.

15 ★★ **a)** The Parliament Shop needs at least **R15 000** of sales in a month to make a profit. In March it is open all **31 days**, and it sells about **R525** a day. **Estimate the March sales:** round 31 to the nearest ten and 525 to the nearest hundred.

Draw your model

31 × 525 ≈ _____ × _____ = _____

b) So will the shop make a profit in March?

- ◯ Yes: 31 and R525 were both rounded down, so the sales are more than R15 000
- ◯ No: the estimate is only R15 000, not more
- ◯ We cannot tell from an estimate

16 ★★ **a)** Max's log says the friends flew **1 389 km** from Cairns to Brisbane and **946 km** from Brisbane to Canberra. **Estimate the total:** round each distance to the nearest hundred.

Draw your model

_____ + _____ = _____ km

b) Now work out the exact total with give and take: make **1 389** the next hundred. **1 389 + 946**

Draw your model

1 389 + 946 = _____ km

17 ★★ **a)** A school group buys **48** flag pins at **R28** each. **Estimate the cost:** round 48 and 28 to the nearest ten.

Draw your model

48 × 28 ≈ _____ × _____ = _____

b) Now work out the exact cost with Partial products over: **48 × 28** rand.

Draw your model

48 × 28 = _____

18 ★★ Tim counts **6 318** visitors at Parliament House on Monday and **9 205** on Tuesday. **Estimate how many more visitors came on Tuesday:** round each number to the nearest thousand.

_____ − _____ = _____ visitors

Draw your model

Estimate and check

REASONING **Is the answer sensible?** Decide, then explain how you know.

19 ★★★

a) To estimate **12 × 53** Max writes 10 × 50 = 500. Max says: "500 is an overestimate." Tim says: "500 is an underestimate." **Who is right?**

- ◯ Max: estimates are always too big
- ◯ Tim: 12 and 53 were both rounded down, so the product is more than 500
- ◯ Neither: 500 is exact

b) So work out **12 × 53** with Smart partial products: keep 53 whole and cut 12 into 10 and 2.

Draw your model

12 × 53 = _____

Explain: _____

20 ★★★

a) To estimate **24 × 412** Max rounds: 20 × 400 = 8 000. Tim uses friendlier numbers: 25 × 400 = 10 000. **Whose estimate is closer to the exact product?**

- ◯ Max's: rounding always gives the closest estimate
- ◯ Tim's: 25 is much closer to 24 than 20 is

b) So work out **24 × 412** with Smart partial products: keep 24 whole and cut 412 into 400 and 12.

Draw your model

24 × 412 = _____

Explain: _____

21 ★★★

a) The Parliament Shop has **119 boxes** of flag pins, with **12 pins** in each box. Round 119 to 120 to estimate, with Smart partial products: keep 120 whole and cut 12 into 10 and 2.

Draw your model

_____ = _____

b) Tim says there are more than **1 500** pins in the boxes. **Is he correct?**

- ◯ Yes: 119 is close to 120
- ◯ We cannot tell from an estimate
- ◯ No: even 120 boxes hold fewer than 1 500 pins, and there are only 119

Explain: _____

22 ★★★

a) Max works out **4 470 + 2 995 = 6 465**. Tim estimates: 4 500 + 3 000 = 7 500. **What does Tim's estimate tell Max?**

- ◯ Max's answer is about 1 000 too small: he must work it out again
- ◯ Max's answer is right: an estimate is never exact
- ◯ Tim's estimate is wrong: 4 470 does not round to 4 500

b) So work it out again with give and take: make 2 995 a whole thousand. **4 470 + 2 995**

Draw your model

4 470 + 2 995 = _____

Explain: _____

Estimate and check

23 ★★★

a) In the Parliament Shop, Max writes down **R2 002** of sales in the morning and **R14 508** in the afternoon. He rounds: R2 000 + R15 000 = R17 000. **Did the shop take more or less than R17 000?**

- ◯ More: R2 002 was rounded down
- ◯ Less: R14 508 went up by much more than R2 002 went down

b) Check: **2 002 + 14 508** with give and take: make 14 508 a whole thousand.

Draw your model

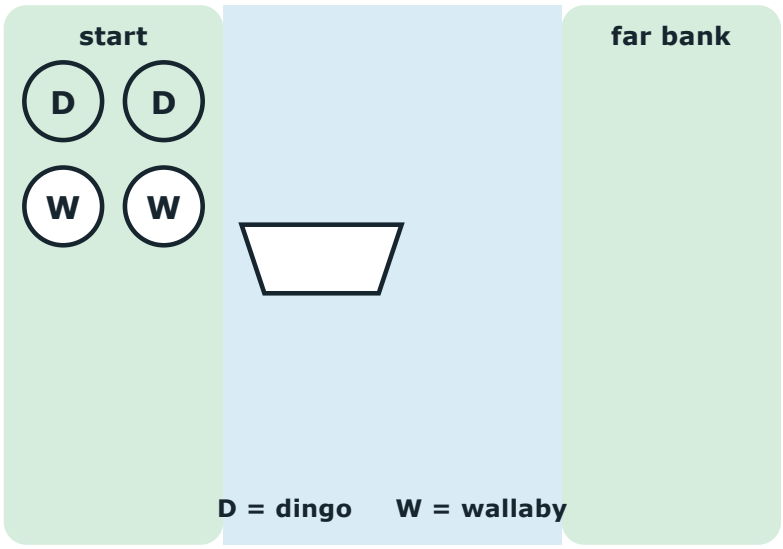
2 002 + 14 508 = _____

Explain: _____

24 PROBLEM OF THE DAY **Dingoes and wallabies**

On the lawn in front of Parliament House, Tim stretches out in the shade of a gum tree and Max reads him a puzzle from an old storybook: two dingoes and two wallabies wait at a river. The raft carries one or two animals and any animal can paddle. Wherever there are wallabies on a bank, the dingoes on that bank may never outnumber them. A bank with no wallabies on it is safe.

Get all the animals across in at most 5 crossings. Write down who is on the raft at every crossing.



Think further: Can three dingoes and three wallabies cross with the same raft? In how many crossings?

Explain one thing you learned.

I can do this: ◯ independently ◯ with help ◯ I need more practice