



Algorithms: multiplying by a value

Use a range of contexts for students to use a spreadsheet to automate the multiplying of values in cells.

Examples may include:

Recipes

Provide recipes that include a small number of ingredients. Have students double or halve the ingredients.

Here is an example of an apple cake recipe. Each ingredient quantity is doubled; therefore the rule is the ingredient quantities multiplied by 2.

In a function * represents multiplied by.

| | Units | Ingredient quantities | Amounts for double the ingredients Rule: =C3*2; then fill down |
|--------------------|----------|-----------------------|---|
| Brown sugar | grams | 250 | 500 |
| Self-raising flour | grams | 250 | 500 |
| Butter | grams | 125 | 250 |
| Apples | | 2 | 4 |
| Egg | | 1 | 2 |
| Cinnamon | teaspoon | $\frac{1}{2}$ | 1 |

Fun run distances

One lap around the sports track is 400m; therefore the rule is the laps multiplied by 400.

| | Laps | distance in metres Rule: =C3*400; then fill down |
|-----------|------|---|
| Student 1 | 2 | 800 |
| Student 2 | 4 | 1,600 |
| Student 3 | 7 | 2,800 |
| Student 4 | 11 | 4,400 |
| Student 5 | 2 | 800 |
| Student 6 | 8 | 3,200 |



Mathematical processes

Doubling and halving

Undertake a [number talk](#) about doubling and halving. Then ask students to explore patterns and computations using a spreadsheet.

They can use the rules:

- doubling: = cell*2
- halving: = $\frac{\text{cell}}{2}$

| | | |
|----------|---------|---------|
| 50 | 18 | ? |
| Doubling | Halving | Product |
| 100 | 9 | 900 |

| | | |
|----------|---------|---------|
| 25 | 20 | ? |
| Doubling | Halving | Product |
| 50 | 10 | 500 |
| 100 | 5 | 500 |

| | | |
|----------|---------|---------|
| 300 | 8 | ? |
| Doubling | Halving | Product |
| 600 | 4 | 2,400 |
| 1,200 | 2 | 2,400 |

Discounted items on sale

The grocery item is half price; therefore the rule is the regular price divided by 2 [= $\frac{\text{cell}}{2}$]

| Grocery item | Regular price | Half price |
|--------------------|---------------|------------|
| Dishwashing liquid | \$ 26.00 | \$ 13.00 |
| Mince meat | \$ 9.00 | \$ 4.50 |
| Pet food | \$ 15.50 | \$ 7.75 |
| Soft drink | \$ 4.50 | \$ 2.25 |
| Potatoes | \$ 6.90 | \$ 3.45 |
| Leg ham | \$ 3.90 | \$ 1.95 |

Reflection

Students discuss how formulas (an algorithm) help them automate a process.

When are spreadsheets useful/not useful?