The Elf Investigation

Teacher Notes

Preparation

- Print a case file for each student or pair. Set the printer options to double-sided and 'flip on short edge'.
- Differentiated versions of the case files are available if needed to suit the individual needs of your students. They are levelled as follows:
  - **Circle Version**: counting collections up to 20, following straightforward directions, multiplying lots of ten by a single-digit number.
  - **Triangle Version**: multiplying single-digit numbers, multi-step directions, adding numbers to a four-digit number.
  - **Square Version**: multiplying a three-digit number by a single-digit number, order of operations, dividing a four-digit number by a single-digit number (using short division without a remainder), counting collections up to 50.

Implementation

1. Have the copies of the case files on hand to give to students.
2. In Slide Show mode, display first slide of **The Elf Investigation PowerPoint** on a screen for all students to see. The larger the screen the better!
3. Ideally, have a second device, like a student laptop, also displaying the PowerPoint. This will allow students to attempt to **Solve** the investigation without interrupting those on the main screen.
4. Click the **Begin** button to display the introduction letter. Read it aloud to the students.
5. Distribute the case files to the students.
6. Click the **Begin** button.
7. Music will start and the map will animate through day and night. The map will continue to loop until the screen is clicked, sending you back to the title screen.
8. If not using a second device, click **Solve** button on the title screen to be directed to a keypad. Students enter the elf identification number by clicking the numbers. If correct they will find the identity of the elf responsible!

Top Tips

- The train and time of day come into play for the **Commute Chaos** puzzle (see the answer explanation page for further details).
- In Square Version of **The Sweet Scavenger Hunt**, the Christmas tree is not a regular pine tree.
- Have some scrap paper handy for students to draw the routes taken in **The Pom Pom Parade** and **Commute Chaos** puzzles.

The Sweet Scavenger Hunt

There are ☐ candy canes through the town.

There are ☐ floating ice chunks in the lake.

There are ☐ sleds on the sledding hill.

 = Answer

Starlight Street

The house you need to find is opposite a blue house.

It is not at the end of the street.

The houses on either side are different colours to each other.

What is the number of the house?

1 2 3 4 5

9 8 7 6

Answer

Identification Number

☐ ☐ ☐

The Elf Investigation

Case File

Name: _____

TeachStarter

Mission Brief

The following document contains all of the clues we have gathered that are linked to the case. Solve the clues in any order, then add together the numbers to reveal the elf's identification number.

The Pom Pom Parade

This year's parade will begin at Delightful Drive and Sunshine Street intersection.

Travel west and then turn right.

While travelling north, take the first street on the right before continuing on the road that travels south.

Finally, turn right onto Snowball Street and finish at the next 'T' intersection.

Look carefully at the shape of the parade route, place the number in the square below and solve the sum.

100 + ☐ = Answer

Not Quite Northern Lights

The elves in this town leave the same lights on every night! Once the sun goes down, you better be quick to count all of their lights!

Can you spot the lit-up windows in the elf houses? How many did you find?

Answer

Commute Chaos

An elf needs to travel from the end of Starlight Street to get to their job at the Candy Cane Factory. They need to leave at 8:00 am and arrive by 9:00 am. Snow from the Sledding Hill has blocked the corner where Pixie Promenade and Snowball Street meet. The star of the Christmas tree has fallen down and is laying across Sunshine Street.

Determine the best way for the elf to get to work. On their way, how many left turns did they make?

20 × ☐ = Answer

The Sweet Scavenger Hunt

There are ☐ houses with a fence attached.

There are ☐ presents that only appear during the day.

There are ☐ candy canes throughout the town.

 +  −  =

Answer

Starlight Street

The house is not an even number.

It is a primary colour.

It is not next to or opposite a yellow house.

The house is not opposite 10 – 7.

What is the number of the house?

1	2	3	4
			5
9	8	7	6

Answer

Identification Number

The Elf Investigation

Case File

Name: _____

TeachStarter

Mission Brief

The following document contains all of the clues we have gathered that are linked to the case. Solve the clues in any order, then add together the numbers to reveal the elf's identification number.

The Pom Pom Parade

This year's parade will begin at the corner of Rudolph Road and Delightful Drive.

Travel west and turn left at the next two intersections where possible.

Continue until a four-way intersection and turn right.

Travel to the next intersection and turn the same way as did for the previous intersection.

Continue along the road until the next 'T' intersection.

Look carefully at the shape of the parade route, place the number in the square below and solve the sum.

3565 + ☐ = Answer

Not Quite Northern Lights

Focus on the elf houses throughout the town. What is the difference between the number of lit-up windows north of the train line and the number of lit-up windows south of the train line?

☐ − ☐ = Answer

Commute Chaos

An elf needs to travel from the end of Starlight Street to get to their job at the Candy Cane Factory. They have the afternoon shift and need to leave at 4:00 pm to arrive by 5:00 pm. The Present Factory has a delivery sleigh out the front which is blocking the road. Traffic is queued up for the Bakery and is blocking the intersection of Adorable Avenue and Sunshine Street.

Determine the best way for the elf to get to work. On their commute, how many left turns did they make?

☐ × 8 + 7 = Answer

The Sweet Scavenger Hunt

There are ☐ regular pine trees in the town.

There are ☐ presents that only appear during the day.

There are ☐ chimneys that blow smoke each day.

( − ) ×  = Answer

Starlight Street

The house is not a prime number.

The house is not opposite a blue house.

Subtract the total of the brown house numbers from the total of the red house numbers. The house is not this number.

The house is not a square number > 4.

The house is not opposite 100 ÷ 50.

What is the number of the house?

1	2	3	4	
				5
9	8	7	6	

Answer

Identification Number

☐ ☐ ☐ ☐

The Elf Investigation

Case File

Name: _____

TeachStarter

☐

Mission Brief

The following document contains all of the clues we have gathered that are linked to the case. Solve the clues in any order, then add together the numbers to reveal the elf's identification number.

The Pom Pom Parade

This year's parade will begin at the northwest corner of the Christmas tree block.

Travel east before turning and travelling south until the next intersection.

Continue until the end of the street and perform a 180° turn.

Travel until the next intersection two times.

Continue to the next 'T' intersection.

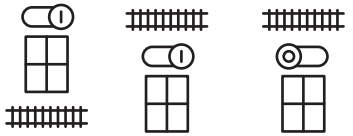
Note: Always turn right when at a four-way intersection.

Look carefully at the shape of the parade route, place the number in the square below and solve the problem.

405 × ☐ = Answer

Not Quite Northern Lights

Look closely at the windows of the elf houses at night and interpret the following symbols to solve the clue.



☐ − ☐ x (☐ - 2) = Answer

Commute Chaos

An elf needs to travel from the end of Starlight Street to get to their job at the Candy Cane Factory. They need to leave at 8:00 am and arrive by 9:00 am. Pixie Promenade is closed north of Lucky Lane. There has been a sleigh accident blocking the intersection of Snowball Street and Delightful Drive. The star of the Christmas tree has fallen off and is laying across Sunshine Street.

Determine the best way for the elf to get to work. On their commute, how many right turns did they make?

☐)1664 Answer

The Sweet Scavenger Hunt

There are 12 candy canes through the town.

There are 4 floating ice chunks in the lake.

There are 2 sleds on the sledding hill.

 = Answer 18

Starlight Street

The house you need to find is opposite a blue house.

It is not at the end of the street.

The houses on either side are different colours to each other.

What is the number of the house?

1 2 3 4 5

9 8 7 6

Answer 2

Identification Number

1 8 9

The Elf Investigation

Case File

ANSWERS

TeachStarter

Mission Brief

The following document contains all of the clues we have gathered that are linked to the case. Solve the clues in any order, then add together the numbers to reveal the elf's identification number.

The Pom Pom Parade

This year's parade will begin at Delightful Drive and Sunshine Street intersection.

Travel west and then turn right.

While travelling north, take the first street on the right before continuing on the road that travels south.

Finally, turn right onto Snowball Street and finish at the next 'T' intersection.

Look carefully at the shape of the parade route, place the number in the square below and solve the sum.

100 + 9 = Answer 109

Not Quite Northern Lights

The elves in this town leave the same lights on every night! Once the sun goes down, you better be quick to count all of their lights!

Can you spot the lit-up windows in the elf houses? How many did you find?

Answer 20

Commute Chaos

An elf needs to travel from the end of Starlight Street to get to their job at the Candy Cane Factory. They need to leave at 8:00 am and arrive by 9:00 am. Snow from the Sledding Hill has blocked the corner where Pixie Promenade and Snowball Street meet. The star of the Christmas tree has fallen down and is laying across Sunshine Street.

Determine the best way for the elf to get to work. On their way, how many left turns did they make?

20 × 2 = Answer 40

The Sweet Scavenger Hunt

There are 10 houses with a fence attached.

There are 6 presents that only appear during the day.

There are 12 candy canes throughout the town.

 +  -  =

Answer
16

Starlight Street

The house is not an even number.

It is a primary colour.

It is not next to or opposite a yellow house.

The house is not opposite 10 - 7.

What is the number of the house?

1 2 3 4 5

9 8 7 6

Answer
9

Identification Number

3 6 2 8

The Elf Investigation

Case File

ANSWERS

TeachStarter

Mission Brief

The following document contains all of the clues we have gathered that are linked to the case. Solve the clues in any order, then add together the numbers to reveal the elf's identification number.

The Pom Pom Parade

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Travel west and turn left at the next two intersections where possible.

Continue until a four-way intersection and turn right.

Travel to the next intersection and turn the same way as did for the previous intersection.

Continue along the road until the next 'T' intersection.

Look carefully at the shape of the parade route, place the number in the square below and solve the sum.

3565 + 5 = Answer 3570

Not Quite Northern Lights

Focus on the elf houses throughout the town. What is the difference between the number of lit-up windows north of the train line and the number of lit-up windows south of the train line?

11 - 9 = Answer 2

Commute Chaos

An elf needs to travel from the end of Starlight Street to get to their job at the Candy Cane Factory. They have the afternoon shift and need to leave at 4:00 pm to arrive by 5:00 pm. The Present Factory has a delivery sleigh out the front which is blocking the road. Traffic is queued up for the Bakery and is blocking the intersection of Adorable Avenue and Sunshine Street.

Determine the best way for the elf to get to work. On their commute, how many left turns did they make?

3 × 8 + 7 = Answer 31

The Sweet Scavenger Hunt

There are 46 regular pine trees in the town.

There are 6 presents that only appear during the day.

There are 10 chimneys that blow smoke each day.

( - ) ×  = Answer 400

Starlight Street

The house is not a prime number.

The house is not opposite a blue house.

Subtract the total of the brown house numbers from the total of the red house numbers. The house is not this number.

The house is not a square number > 4.

The house is not opposite 100 ÷ 50.

What is the number of the house?

1 2 3 4

5

9 8 7 6

Answer 6

Identification Number

2 0 4 5

The Elf Investigation

Case File

ANSWERS

TeachStarter

Mission Brief

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The Pom Pom Parade

This year's parade will begin at the northwest corner of the Christmas tree block.

Travel east before turning and travelling south until the next intersection.

Continue until the end of the street and perform a 180° turn.

Travel until the next intersection two times.

Continue to the next 'T' intersection.

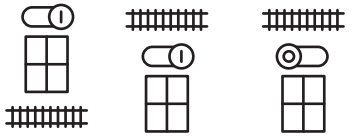
Note: Always turn right when at a four-way intersection.

Look carefully at the shape of the parade route, place the number in the square below and solve the problem.

405 × 3 = Answer 1215

Not Quite Northern Lights

Look closely at the windows of the elf houses at night and interpret the following symbols to solve the clue.



11 − 9 x (6 - 2) = Answer 8

Commute Chaos

An elf needs to travel from the end of Starlight Street to get to their job at the Candy Cane Factory. They need to leave at 8:00 am and arrive by 9:00 am. Pixie Promenade is closed north of Lucky Lane. There has been a sleigh accident blocking the intersection of Snowball Street and Delightful Drive. The star of the Christmas tree has fallen off and is laying across Sunshine Street.

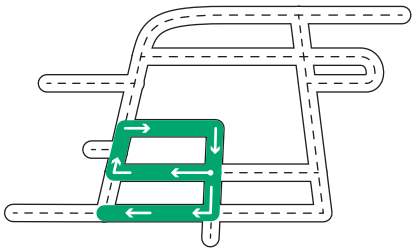
Determine the best way for the elf to get to work. On their commute, how many right turns did they make?

4) 1664 Answer 416

Answer Explanations

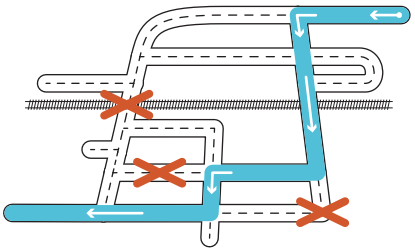
Circle Version

The Pom Pom Parade



The path of the parade makes a '9'.

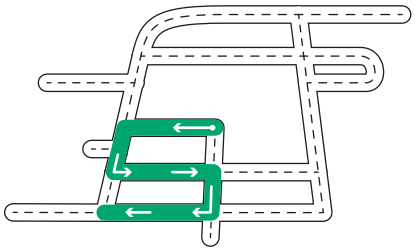
Commute Chaos



The west train crossing is closed during the elf's commute between 8:00 am and 9:00 am.

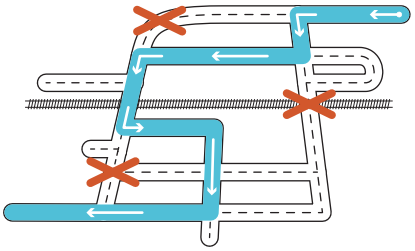
Triangle Version

The Pom Pom Parade



The path of the parade makes a '5'.

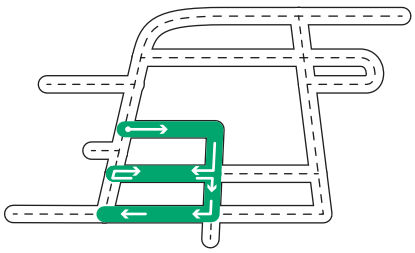
Commute Chaos



The east train crossing is closed during the elf's commute between 4:00 pm and 5:00 pm.

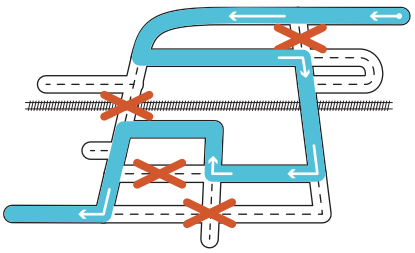
Square Version

The Pom Pom Parade



The path of the parade makes a '3'.

Commute Chaos



The west train crossing is closed during the elf's commute between 8:00 am and 9:00 am.