

STATISTICS: TALLIES AND PICTOGRAMS**KEY STAGE(S):** 3**SUBJECT/CURRICULUM AREA(S):** Maths**TOPIC:** Interpreting and constructing pictogram and tally charts**LANGUAGE LEVEL:** New to English - Developing competence**RESOURCE CONTENTS**

- *Flashcards: colours* (PowerPoint);
- *Flashcards: vocabulary* (PowerPoint);
- *Pictogram activities: riddles* (in the PDF file);
- *Pictogram activities: individual work* (in the PDF file);
- *Tally and bar chart activity* (in the PDF file).

CURRICULUM OBJECTIVES

- To interpret and present data using pictograms, tally charts and bar charts.

Language functions**Useful Language****Asking and answering questions**

What is the frequency of colour blue/red/green/yellow?
The frequency of colour blue/red/green/yellow is..... .

How many... are there?
There are ... [number] ...

Describing

I have picked a blue/red/green/yellow card.

Expressing opinions

I agree. This is correct.
I disagree.

Justifying

I disagree because...
This is incorrect because...

Comparing and contrasting

There are six more... than...

Vocabulary

Nouns: the frequency of, a rose, a tulip, a daffodil, a hyacinth, a sunflower, a flower, midnight, a column, tally, the sum, pictogram

Adjectives: blue, red, green, yellow, correct, incorrect

Verbs: to agree, to disagree, to equal, to record

Adverbs: altogether

Prepositions: times, plus, minus

Phrases: ... times / twice as many as..., ... more ... than...

PREPARATION

- *Flashcards: colours.* print 12 cards of each colour. Print 4 colour cards per A4 page for every pair of learners, on card and laminated whenever possible. Alternatively, you could use regular colour paper you might already have in your school, e.g., red printing paper.
- *Tally and bar chart activity.* For every pair of learners, print:
 - 1 copy of Part 1 (A4);
 - 1 copy of Part 2 (A3 if possible);
 - 2 copies of Substitution tables (A4).
- *Flashcards: vocabulary.* For every pair of learners, print 1 set of cards. Print 4 cards per A4 page, on card and laminated whenever possible.
- *Pictogram activities. individual work:* For every learner, print 1 copy of the entire document (A4).
- *Pictogram activities: riddles.* Print 1 copy (A4) of the Learner A and B pages for every pair of learners. Print however many copies of the last page (the empty grid) you might require.

IDEAS FOR USING THIS RESOURCE

Tally and bar chart activity



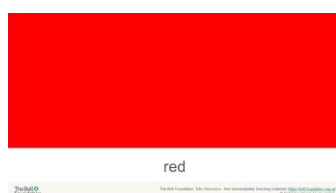
In this [barrier game](#) activity for a pair of learners, one learner completes a tally chart based on information provided by the other learner. Based on the tally chart, both learners then present the data on a bar chart.

Tally diagram:

- Put the *Flashcards: colours* on the table for the learners, face-down. There should be 48 cards, with 12 cards of each colour printed. Shuffle the cards for the learners so that they are mixed up.
- Give one copy of *Part 1: Tally chart* (from *Tally and bar chart activity*) to Learner A, who will be completing it.
- Ask Learner B to pick the first of the colour cards. Learner B needs to show the colour card to the other learner and say, '*I have picked a blue/red/green/yellow card.*' You could choose to write this sentence on the board for the learner or provide them with strips of paper with the model sentences.
- Learner A now records this in the tally chart. (A table on how to use tally marks is provided in the same resources for learners who might be brand new to the concept.) Learner A also says, '*The blue/red/green/yellow cards tally is now...*' while doing so. You might wish to go over the tally chart to demonstrate how to use it and how to write tallies.
- This continues until 30 cards have been picked. Learner B now writes the frequency of the colours by counting up the tally marks. Both learners need to agree on the answer by speaking. To help them structure their talk, you can use the substitution tables provided in the resource below the bar chart.

Bar chart:

- Learners are now going to transfer the information from the tally chart onto the bar chart. They can decide which of them is going to be Learner A for this activity (drawing the bars) and which Learner B (read the data from the tally chart).
- Learner A asks once again about the frequency of the colours, and Learner B provides learner A with information. Learner A then draws the bar chart for that colour. To exchange this information, learners can use the [substitution tables](#) provided.
- Please ensure that there is some kind of a barrier between the learners for this activity and that Learner A does not see the tally chart sheet that Learner B has, so that the learner can focus on the development of listening and speaking skills. Learners can also sit back to back for the same.



The tally chart:

Colour	Tally	Frequency
blue		
red		
green		
yellow		

Answers

The frequency of the colour	blue	1.
	red	2.
	green	3.
	yellow	4.
		5.
		6.
		7.
		8.
		9.
		10.
		11.
		12.
		13.
		14.
		15.






Pictogram activities: riddles





These riddles are barrier game activities where learners complete pictogram tables based on sets of sentences (the riddles) and then solve equations to demonstrate that they can interpret the data.

The following instructions are equally applicable to all the four riddles presented in this resource.

- Learner A first draws two pictures in the key section to represent the numbers. In the case of Question 1, learners might draw a flower to represent 10 flowers, and they might draw half a flower to represent 5 flowers.
- Now, Learner B reads, one by one, the sentences from their sheet. (Learner B might need to repeat the sentences a few times for Learner A if this is needed.) Learner A now records the data using pictograms. Learner B has the correct answers on their sheet (thus it is important that Learner A does not see these answers) and can check if Learner A gets the data correctly.
- Now, both Learner A and Learner B work together to record the data in the equation column. They will need to do this by taking turns, e.g., in Question 1, Learner A writes the answers for roses, daffodils and sunflowers, and Learner B for tulips and hyacinths.
- As the learners write the equations, they are asked to say their answers in sentences, e.g., *'Three times five equals fifteen.'* The other learner needs to say if they agree or disagree with the result, and if not, why not. The reason given should be an equation as well, e.g., *'It is incorrect because four times two equals eight.'* Model sentences are provided on the sheets. In addition, the *Flashcards: vocabulary* cards can be printed out for learners to aid them with vocabulary.

		Equations
Roses		
Tulips		
Daffodils		
Hyacinths		
Sunflowers		

	2 3 hours of sun		2 1 1/2 hours of sun
Pictogram table:			
Monday			Equations
Tuesday			
Wednesday			
Thursday			
Friday			

Pictogram activities: individual work




These activities provide resources for those teachers who might teach a learner in a 1-to-1 situation or a learner who might prefer to work on their own: learners might be of an introverted temperament or, if new to English, still in silent period (early days or weeks in a new country when they are not yet ready to attempt speaking in the new language).

- Provide the resource to the learner as a booklet or one part at a time, whichever you deem more suitable and/or appropriate.
- Learners will need to interpret the pictogram tables in each question and answer the questions under them. We suggest that the learners first write the mathematical answer (equation) and follow it with a sentence, e.g., ' $10 \times 2 = 20$. *There are twenty roses in the garden.*'
- If a learner is new to English, you can provide them with the answers to the questions jumbled up. The sentences in the tables are mixed-up, so that learners still need to decide which answer belongs with which question. The gaps in the sentences need to be filled in with numbers (mathematical answers to the questions), and in the interest of focusing on developing English language skills, you can ask your learner(s) to write these in words rather than numerically.

Answer the questions below by writing equations next to them.

- 1 – How many buses are there between 6am and 9am?
Equation: _____ Sentence answer: _____
- 2 – How many buses are there between 3pm and 6pm?
Equation: _____ Sentence answer: _____
- 3 – How many buses come at the busiest bus time of the day?
Equation: _____ Sentence answer: _____
- 4 – How many more buses are there at 6pm-8pm than at 9pm to midnight?
Equation: _____ Sentence answer: _____
- 5 – How many buses are there in the morning?
Equation: _____ Sentence answer: _____

Jumbled up answers: Question 4

	hours / were / sun / _____ / on / of / There / Monday.
	on / There / altogether / of / hours / _____ / sun /
	Monday / and / Tuesday / were
	Tuesday / _____ / sun / on / were / hours / of / There
	of / Thursday / _____ / were / hours / There / sun / on
	There / were / hours / sun / Wednesday / on / of / than /
	/ on / more / Friday

DIFFERENTIATION FOR SUPPORT AND CHALLENGE

Support

- Allow learners the use of [bilingual dictionaries](#) (or online translation tools such as Google Translate) to translate any words in the wording of riddles and associated questions they might need to.
- Consider using [translanguaging](#). For instance, learners could formulate the sentence answers to the questions in *Pictogram activities: individual work* first in their own language before writing them in English.
- [Model](#) the language you expect the learners to use before they start on any and all of the activities. If there is a learner in the class that is confident enough to model pair work with you, ask them to help you out.

Challenge

- Learners who are more proficient users of the English language (Band C, in all likelihood) can make use of the last page of the *Pictogram activities: riddles* resource, which is an empty grid for creating their own pictogram table, with space for writing riddle questions.

Statistics: tallies and pictograms

Pictogram activities: individual work

Subject(s): Maths

Key Stage: KS3

Topic: Interpreting and constructing pictogram and tally charts

Part 1: Pictogram questions

Question 1

The pictogram below shows how many different flowers grow in Maya's garden.

	=10 flowers		= 5 flowers
---	-------------	---	-------------

Roses	 
Tulips	  
Daffodils	    
Hyacinths	  
Sunflowers	

Answer the questions below by writing equations next to them.

1 – How many roses are there in the garden?

Equation: _____ Sentence answer: _____

2 – How many sunflowers are there in the garden?

Equation: _____ Sentence answer: _____

3 – What's the number of Maya's favourite flower?

Equation: _____ Sentence answer: _____


4 – How many more tulips are there than roses?

Equation: _____ Sentence answer: _____

5 – How many daffodils and hyacinths are there together?

Equation: _____ Sentence answer: _____














Jumbled up answers: Question 1

	_____ / garden. / roses / There / the / in / are
	There / in / the / _____ / garden. / are / sunflowers
	There / than / are / _____ / more / roses. / tulips
	altogether. / There / are / hyacinths / _____ / and / daffodils
	garden. / daffodils / are / in / _____ / There / the

Question 2

The pictogram below shows how many buses come to the bus stop near Jamal's house at different times every Monday.

	=4 buses		= 2 buses
---	----------	---	-----------

6am-9am	 
9am-12 midday	 
12 midday-3pm	
3pm-6pm	   
6pm-9pm	  
9pm-12 midnight	

Answer the questions below by writing equations next to them.

1 – How many buses are there between 6am and 9am?

Equation: _____ Sentence answer: _____

2 – How many buses are there between 3pm and 6pm?

Equation: _____ Sentence answer: _____

3 – How many buses come at the busiest bus time of the day?

Equation: _____ Sentence answer: _____


4 – How many more buses are there at 6pm-9pm than at 9pm to midnight?

Equation: _____ Sentence answer: _____

5 – How many buses are there in the morning?

Equation: _____ Sentence answer: _____
















Jumbled up answers: Question 2

	and / 9pm / 6pm / midnight. / more / buses / _____ / than / and / 9pm / between / There / are / between
	buses / morning. / are / the / _____ / There / in
	and / There / buses / are / _____ / between / 6am / 9am.
	There / buses / are / _____ / between / 12. / and / 9am
	6pm. / are / and / buses / There / 3pm / between / _____

Question 3

The pictogram below shows how many different stray (=wild) cats live in five different streets in London.

	=4 cats		= 2 cats
---	---------	---	----------

Birch Grove	   
Hart Grove	 
Byron Road	 
Whitehall Gardens	   
East Avenue	  

Answer the questions below by writing equations next to them.

1 – How many cats are there in Hart Grove?

Equation: _____ Sentence answer: _____

2 – How many cats live in Whitehall Gardens?

Equation: _____ Sentence answer: _____

3 – In the street with most cats, how many cats are there?

Equation: _____ Sentence answer: _____

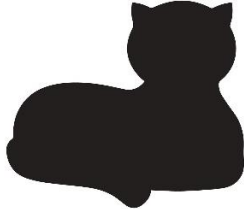
4 – How many more cats are there in Birch Grove than in East Avenue?

Equation: _____ Sentence answer: _____

5 – How many cats are there in Birch Grove and Whitehall Gardens together?

Equation: _____ Sentence answer: _____













Jumbled up answers: Question 3

	are / Hart Grove. / in / _____ / There / cats
	are / Birch Grove. / in / There / cats / _____
	in / _____ / There / in / than / are / cats / Birch Grove / more / East Avenue.
	are / Birch Grove / _____ / altogether. / Whitehall Gardens / There / cats / in / and
	in / are / Whitehall Gardens. / There / _____ / cats

Question 4

The pictogram below shows how many hours of sun there was on different days of the week

	=3 hours of sun		= 1 ½ hours of sun
---	-----------------	---	--------------------

Monday	  
Tuesday	  
Wednesday	
Thursday	 
Friday	  

Answer the questions below by writing equations next to them.

1 – How many hours of sunshine were there on Thursday?

Equation: _____ Sentence answer: _____

2 – How many hours of sunshine were there on Monday?

Equation: _____ Sentence answer: _____

3 – How many hours of sunshine were there on the sunniest day?

Equation: _____ Sentence answer: _____


4 – How many more hours of sunshine were there on Friday than on Wednesday?

Equation: _____ Sentence answer: _____

5 – How many hours of sunshine were there on Monday and Tuesday together?

Equation: _____ Sentence answer: _____

Jumbled up answers: Question 4

	hours / were / sunshine / _____ / on / of / There / Monday.
	on / There / altogether. / of / hours / _____ / sunshine / Monday / and / Tuesday / were
	Tuesday. / _____ / sunshine / on / were / hours / of / There
	of / Thursday. / _____ / were / hours / There / sunshine / on
	There / were / hours / sunshine / Wednesday. / on / of / than / _____ / on / more / Friday

Statistics: tallies and pictograms

Pictogram activities: riddles

Subject(s): Maths

Key Stage: KS3

Topic: Interpreting and constructing pictogram and tally charts

Pictogram barrier game

Question 1: Learner A

Instructions:

1. In the first table below, draw your own pictures to represent 10 flowers and 5 flowers to the left of the numbers.
2. Listen to the information that Learner B has about how many flowers grow in Maya's garden.
3. Draw the pictures in the pictogram table to show the number of each of the flowers.

Key:

	=10 flowers		= 5 flowers
--	-------------	--	-------------

Pictogram table:

	Equations
Roses	
Tulips	
Daffodils	
Hyacinths	
Sunflowers	

Now, together, write equations for the number of all the flowers, taking turns for each row.

Say your equations when you write them, e.g., '*Three times five equals fifteen.*' ($3 \times 5 = 15$)

Say if you agree with Learner B's equations. If you don't agree, say why.

I agree.

This is correct
because...

I disagree
because...

This is incorrect
because...

Question 1: Learner B

Instructions:

Read the sentences below to Learner A one by one.

1. There are 10 roses in the garden.
2. There are 5 sunflowers in the garden.
3. There are 6 times more tulips than sunflowers.
4. There are 15 more daffodils than sunflowers.
5. There are 5 less hyacinths than tulips.

After Learner A has completed their table, show them the Pictogram table answers below.

		Equations
Roses	 	
Tulips	  	
Daffodils	    	
Hyacinths	  	
Sunflowers		

Now, together, write equations for the number of all the flowers, taking turns for each row.

Say your equations when you write them, e.g., '*Three times five equals fifteen.*' ($3 \times 5 = 15$)

Say if you agree with Learner A's equations. If you don't agree, say why.

I agree.

This is correct
because...

I disagree
because...

This is incorrect
because...

Question 2: Learner A

Instructions:

1. In the first table below, draw your own pictures to represent 4 buses and 2 buses to the left of the numbers.
2. Listen to the information that Learner B has about how many arrive at different times of the day at Jamal's bus stop and
3. Draw the pictures in the pictogram table to show the number for each time of day.

Key:

	=4 buses		= 2 buses
--	----------	--	-----------

Pictogram table:

	Equations
6am-9am	
9am-12 midday	
12 midday-3pm	
3pm-6pm	
6pm-9pm	
9pm-12 midday	

Now, together, write equations for the number of all the bus times, taking turns for each row.

Say your equations when you write them, e.g., 'Three times two equals six.' ($3 \times 2 = 6$)

Say if you agree with Learner B's equations. If you don't agree, say why.

I agree.

This is correct
because...

I disagree
because...

This is incorrect
because...







Question 2: Learner B

Instructions:

Read the sentences below to Learner A one by one.

1. There are only 2 buses between 9pm and 12 midnight.
2. There are 3 times as many buses between 9am and 12 midday than after 9pm.
3. There are 2 more buses between 6am and 9am than between 9am and 12 midday.
4. There are 7 times as many buses between 3pm and 6pm than after 9pm.
5. There are 4 less buses between 6pm and 9pm than between 3pm and 6pm.
6. There is the same number of buses after 9pm as between 12 midday and 3pm.

After Learner A has completed their table, show them the Pictogram table answers below.

		Equations
6am-9am		
9am-12 midday		
12 midday-3pm		
3pm-6pm		
6pm-9pm		
9pm-12 midday		

Now, together, write equations for the number of all the bus times, taking turns for each row.

Say your equations when you write them, e.g., '*Three times two equals six.*'

Say if you agree with Learner A's equations. If you don't agree, say why.

I agree.

This is correct
because...

I disagree
because...

This is incorrect
because...

Question 3: Learner A

Instructions:

1. In the first table below, draw your own pictures to represent 4 cats and 2 cats to the left of the numbers.
2. Listen to the information that Learner B has about how many stray cats live in the different London streets
3. Draw the pictures in the pictogram table to show the number for each street.

Key:

	=4 cats		= 2 cats
--	---------	--	----------

Pictogram table:

		Equations
Birch Grove		
Hart Grove		
Byron Road		
Whitehall Gardens		
East Avenue		

Now, together, write equations for the number of all the streets, taking turns for each row.

Say your equations when you write them, e.g., '*Two times two plus one equals five.*'

Say if you agree with Learner B's equations. If you don't agree, say why.

I agree.

This is correct
because...

I disagree
because...

This is incorrect
because...






Question 2: Learner B

Instructions:

Read the sentences below to Learner A one by one.

1. There are 6 cats in Hart Grove.
2. There are 2 more cats in Byron Road than in Hart Grove.
3. There are twice as many cats in East Avenue than in Hart Grove.
4. There are 2 more cats in Whitehall Gardens than in East Avenue.
5. There are 2 cats less in Whitehall Gardens than in Birch Grove.

After Learner A has completed their table, show them the Pictogram table answers below.

		Equations
Birch Grove		
Hart Grove		
Byron Road		
Whitehall Gardens		
East Avenue		

Now, together, write equations for the number of all the streets, taking turns for each row.

Say your equations when you write them, e.g., *'Two times four plus two equals ten.'*

Say if you agree with Learner A's equations. If you don't agree, say why.

I agree.

This is correct
because...

I disagree
because...

This is incorrect
because...

Question 4: Learner A

Instructions:

1. In the first table below, draw your own pictures to represent 3 hours of sunshine and 1 $\frac{1}{2}$ hours of sunshine to the left of the numbers.
2. Listen to the information that Learner B has about how many hours of sunshine there were on different weekdays
3. Draw the pictures in the pictogram table to show the number for each day.

Key:

	=3 hours of sunshine		= 1 $\frac{1}{2}$ hours of sunshine
--	----------------------	--	-------------------------------------

Pictogram table:

	Equations
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

Now, together, write equations for the number of all the weekdays, taking turns for each row.

Say your equations when you write them, e.g., 'Two times three plus one and a half equals seven and a half.'

Say if you agree with Learner B's equations. If you don't agree, say why.

I agree.

This is correct
because...

I disagree
because...






This is incorrect
because...

Instructions:

Read the sentences below to Learner A one by one.

1. There were $10 \frac{1}{2}$ hours of sunshine on Monday.
2. There were $1 \frac{1}{2}$ hours less sunshine on Thursday than on Monday.
3. There were 5 times as many hours of sunshine on Monday than on Wednesday.
4. There were the same number of hours of sunshine on Friday as on Monday.
5. There was $\frac{1}{2}$ hour more sunshine on Tuesday than on Friday.

After Learner A has completed their table, show them the Pictogram table answers below.

		Equations
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		

Now, together, write equations for the number of all the weekdays, taking turns for each row.

Say your equations when you write them, e.g., '*Two times three plus one and a half equals seven and a half.*'

Say if you agree with Learner A's equations. If you don't agree, say why.

I agree.

This is correct
because...

I disagree
because...





This is incorrect
because...

Make your own pictogram riddle

Key:



Pictogram table:

		Equations
		
		
		
		
		

Riddle sentences:

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

Statistics: tallies and pictograms

Tally and bar chart activity

Subject(s): Maths

Key Stage: KS3

Topic: Interpreting and constructing pictogram and tally charts

Part 1: Tally chart

Learner A


1. Pick 30 different colour cards from the pile.
2. Show your card to Learner B and say which colour it is (see the speech bubble), Your partner will write down the number of different colour cards you have.
3. At the end, check that you agree with the frequency that Learner B has written in the column on the right. Use the substitution tables to help you talk.

A green speech bubble with a white border and a drop shadow, containing text.

**I have picked a
blue/red/green/
yellow card.**











Learner B

1. Listen to Learner A and look at the colour of the card.
2. Record the colour as a tally in the chart below.
3. Say to Learner A what you are recording (see the speech bubble). Repeat this until there are no more cards.
4. Write the frequency (the sum) for all the colours. Use the substitution tables to help you talk.


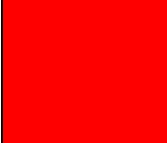

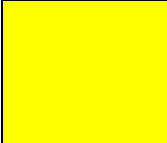
A green speech bubble with a white border and a drop shadow, containing text.

**The
blue/red/green/
yellow card
tally is now 3.**

How to show numbers using tally marks:

				
1	2	3	4	5
				
6	7	8	9	10

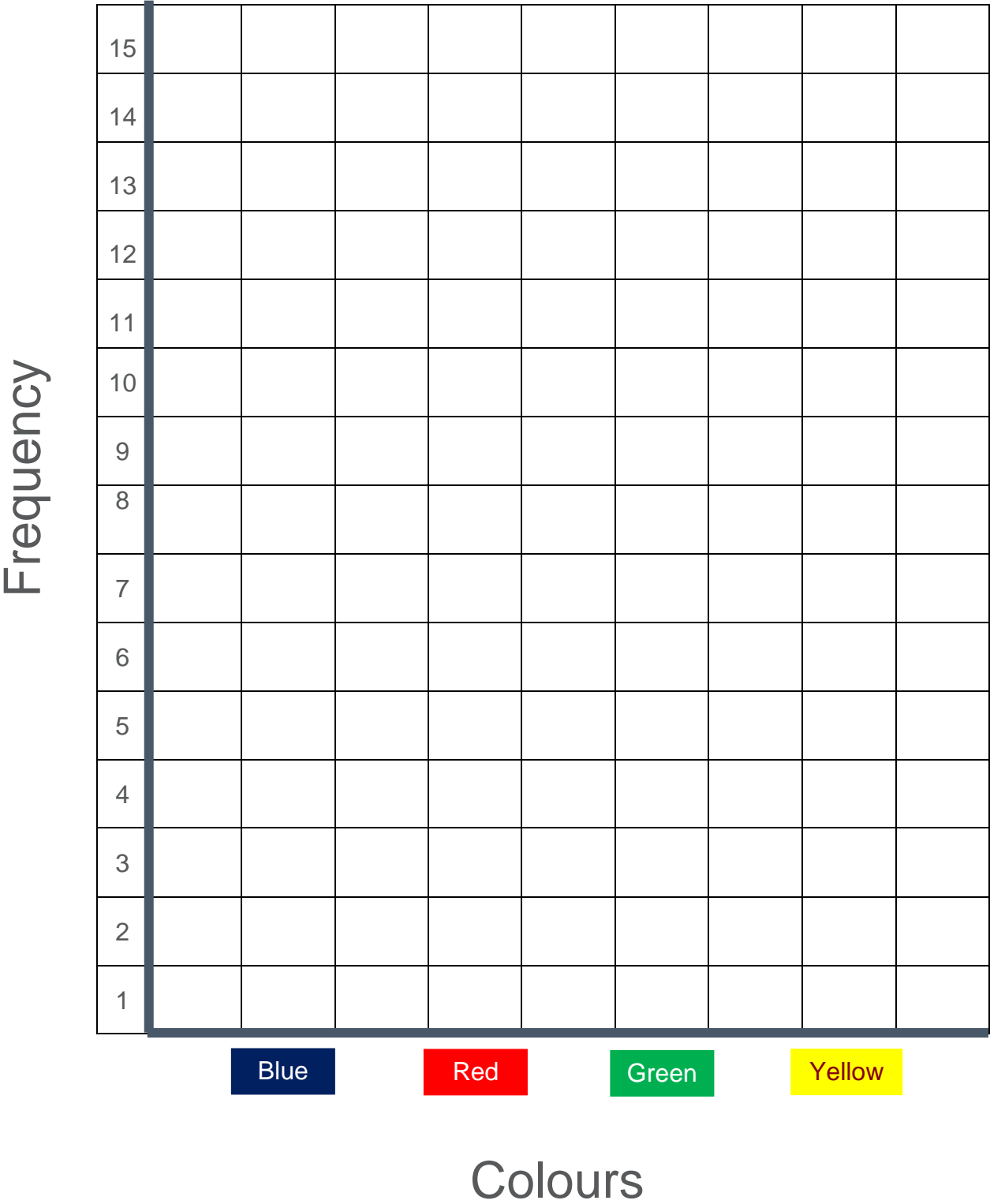
The tally chart:

Colour	Tally	Frequency
		
		
		
		

Part 2: Bar chart

Both learners

Work together to record the frequency (from the tally chart) on this bar chart. Use the substitution tables to help you talk.



Substitution tables

Questions

What is the frequency of the colour	blue?
	red?
	green?
	yellow?

Answers

The frequency of the colour			1.
			2.
			3.
			4.
	blue		5.
	red		6.
			7.
	green	is	8.
			9.
	yellow		10.
			11.
			12.
			13.
			14.
			15.