

DigiTech Scheme of Work

Unit 2.4 –

Questioning



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Introduction

This unit is designed to help children learn about the importance of phrasing questions and that certain data-handling resources are limited in the answers they can provide.

The lessons assume that children are logged in to Purple Mash with their own individual usernames and passwords so their work will be saved in their own folders automatically and can be easily reviewed and assessed by the class teacher. These lesson plans make use of the facility within Purple Mash to set activities for children which they can then complete and hand in online (2Dos). If children have not opened 2Dos before, then they will need more detailed instructions about how to do this. A teacher's guide to 2Dos can be found in the Teacher section: [2Dos Guide](#).

If you are currently using a single login per class or group and would like to set up individual logins yourself, then please see our guide to doing so at [Create and Manage Users](#).

Alternatively, please contact support at support@2simple.com.au or +61 (0) 380 015 024.

If children have not used and logged on to Purple Mash before, then they will need to spend some time learning how to do this before starting these lessons. Young children can be supported by having their printed logon cards (produced using Create and Manage Users) to hand.



Medium-Term Plan

Lesson	Title	Success Criteria
<u>1</u>	Using and Creating Pictograms	<ul style="list-style-type: none">Children understand that the information on pictograms cannot be used to answer more complicated questions.
<u>2</u>	Asking Yes / No Questions	<ul style="list-style-type: none">Children have used a range of yes/no questions to separate different items.
<u>3</u>	Binary Trees	<ul style="list-style-type: none">Children understand what is meant by a binary tree.Children have designed a binary tree to sort pictures of children.
<u>4</u>	Using 2Question - a Computer-Based Binary Tree Program	<ul style="list-style-type: none">Children understand that questions are limited to 'yes' and 'no' in a binary tree.Children understand that the user cannot use 2Question to find out answers to more complicated questions.Children have matched 2Simple item pictures to names using a binary tree.
<u>5</u>	Using 2Investigate: a Non-Binary Database.	<ul style="list-style-type: none">Children understand what is meant by a database.Children have used a database to answer simple and more complex search questions.

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Lesson 1 – Using and Creating Pictograms

Aim

- To show that the information provided on pictograms is of limited use beyond answering simple questions.

Success criteria

- Children understand that the information on pictograms cannot be used to answer more complicated questions.

Resources

Unless otherwise stated, all resources can be found on the [main unit 2.4 page](#). From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- [Type of Homes - activity](#) (print for children).
- [Types of Homes Spreadsheet](#).
- Example Pictogram [Types of Homes Pictogram](#). If you wish children to use the example pictogram, then it can be set as a 2Do for the class.

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria Explain that for this lesson, we will be thinking about the houses that the children live in and producing simple pictograms of the data
Houses We Live In	Use slides 4-11 . Clicking reveals the name of the home type. Discuss the features of each house type.
Activity 1: My House	Display slide 12 . Give out Type of Homes - activity. and encourage children to draw what their home looks like, what it is made from, how many rooms it has and how many people live there. The icon on the slide will open the file to demonstrate on the board.
Collecting the Information.	Display slide 13 . The icon on the slide will open the file to demonstrate on the board. On the whiteboard, collate some of the information from the children's pictures. You could collate the results in the 2Calculate file Types of Homes or on the whiteboard. Save this file as you may need it for subsequent activities. Save this resource once the results are entered.

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Pictograms	<p>Display slide 14. Explain how to design and create a simple pictogram using the information collected from the children. You can use the sample 2Count pictogram 'Types of Homes' by clicking on the icon or create one of your own. Click to reveal the points to demonstrate:</p> <ul style="list-style-type: none"> • Clicking in the rectangle then selecting an image to represent the answer or using the paint button to draw the picture. • Clicking on the + or – to record the data. <p>Demonstrate how to do this using 2Count.</p>
Information on Pictograms	<p>Display slide 15. Ask the children to use the pictogram to answer some simple questions whose answer can be ascertained from the pictograms</p> <ul style="list-style-type: none"> • How many people live in semi-detached houses? • Do more people live in flats than bungalows? • How many houses have four people living in them? <p>With the class, look at what information the pictograms cannot provide you with. For instance:</p> <ul style="list-style-type: none"> • How many semi-detached houses have four people living in them? • How many people living in bungalows have four or more rooms?
Activity 2: Creating my Own Pictogram	<p>Display slide 16. Open the data you saved earlier on the spreadsheet. The children can then create and fill in the data in their own 2Count pictogram. Some children might need to use the sample and just enter data rather than create from scratch. Set this as a 2Do for those children</p> <p>Can the children think of any questions of their own that the pictograms cannot answer?</p>
Extension: Looking at Pictograms	<p>Display slide 17. Ask children to look at the pictogram image that shows birthday month for children in a class.</p> <p>What could the pictogram tell them when they looked at it? (How many children had a birthday in a particular month)</p> <p>What couldn't the pictogram tell them when they looked at it? (Who had a birthday in which month)</p> <p>Can they think of a reason why this pictogram is not a good idea? (It only has 10 months – November and December have not been included as they pictogram only allows 10 choices).</p>
Review Success Criteria	<p>Display slide 18. Review the success criteria from slide 3. Children could rate how well they achieved this using a show of hands.</p>



Lesson 2 – Asking Yes / No Questions

Aim

- To use yes/no questions to separate information.

Success criteria

- Children have used a range of yes/no questions to separate different items.

Resources

Unless otherwise stated, all resources can be found on the [main unit 2.4 page](#). From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- [Purple Mash Avatar Game](#) (print for children).
- Scissors

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria Recap the learning from the last lesson.,
Sorting Objects	Display Slide4 . Show the children the different shapes on the slide. Show how we can use simple questions with a yes/no answer to separate them e.g. <ul style="list-style-type: none">Is the shape red?Does the shape have 4 sides?
Sorting Characters	Display slide 5 . Show the children four characters from the Purple Mash avatars. Choose one. Explain how we can use a range of yes/no questions to separate the avatars so we can select one. Discuss how we can ask questions relating to hair colour, hats, glasses etc.
Activity 1: Which Character?	Display slide 6 . Hand the children a copy of the Purple Mash Avatar Game . The children cut up the 12 images and then they play a game like Guess Who? Remind the children they can only use questions with a yes/no answer. Clicking the icon will open the file on the board for demonstration.

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<p>Activity 2: Extension: Smarter Questions</p>	<p>Display slide 7. How many YES / NO questions needed to be asked before an answer was reached?</p> <p>Can children improve on this by thinking about and improving the questions that they ask?</p> <p>What type of questions work well?</p> <p>Look at the need to split the pictures into two.</p> <p>Repeat the game and find the fewest number of questions needed to find an answer.</p>
<p>Review Success Criteria</p>	<p>Display slide 8. Review the success criteria from slide 3. Children could rate how well they achieved this using a show of hands.</p>

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Lesson 3 – Binary Trees

Aim

- To construct a binary tree to separate different items.

Success criteria

- Children understand what is meant by a binary tree.
- Children have designed a binary tree to sort pictures of children or animals.

Resources

For this lesson, and following lessons, there are two possible topics for the data: Continuing to use the avatars data or using data about animals.

- [‘yes’ and ‘no’ arrows](#) You will need several copies to construct a paper binary tree oneither the floor or the wall (depending on your classroom layout).
- Whiteboard/paper.
- [Large avatars pictures](#) from the last lesson or [large animal pictures](#).
- [Avatar Binary Tree Images](#). or [Animal Binary Tree Images](#). Print one copy per child/pair.
- [Binary Tree Outline](#). These will need to be enlarged to A3 size and printed for each child/pair. Completed examples for these are available at the end of this document.
- Glue, scissors and Blu-Tack.

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria Recap the learning from the last lesson. For this lesson you need to decide if you are going to use the avatars or animal pictures.
How to Sort the Objects on a Binary Tree	Display slide 4 . Explain to the children that the class will be creating a binary tree. Since binary trees are used for identification of unknown items, the questions must be something observable rather than requiring knowledge of the item e.g. ‘Does it have legs?’ rather than, ‘Is it an herbivore?’ Splitting into equal halves will result in the fewest (average) number of steps to the solution for all the items. Write the question onto paper/whiteboard and then put ‘yes’/‘no’ arrows on the floor or Blu-Tack them to the board. It is advisable to enlarge the arrows onto A3 paper.

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	Repeat until all the items are sorted individually. Select one item and check that the binary tree works and leads to the correct item.
Activity 1: Creating Your Own Binary Tree.	Display slide 5 . The children should complete their own binary tree using the avatars or animals and the outline sheet.
Activity 2: Extension - Binary Tree	Display slide 6 . Recap the learning from Activity 1. What went well and what could be improved? Use the other set of images to create another binary tree.
Review Success Criteria	Display slide 7 . Review the success criteria from slide 3 . Children could rate how well they achieved this using a show of hands.

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Lesson 4 – Using 2Question: A Computer-Based Binary Tree Program

Aim

- Use 2Question (a binary tree) to answer questions.

Success criteria

- Children understand that answers are limited to 'yes' and 'no' in a binary tree.
- Children understand that the user cannot use 2Question to answer more complicated questions.
- Children have matched the 2Simple item pictures to names, using a binary tree.

Resources

Unless otherwise stated, all resources can be found on the [main unit 2.4 page](#). From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

For this lesson, and following lessons, there are two possible topics for the data: Continuing to use the avatars data or using data about animals.

- [2Question database – Avatars](#) or [2Question database - Animals](#). Set whichever theme you selected in the previous lesson as a 2Do for your class.
- [Avatar Names Question Sheet](#) or [Animal Names Question Sheet](#). **Print children copies of the worksheet which matches your chosen theme.** Answers are available at the end of this document.
- Extension: [Debugging Challenge](#). Set this as a 2Do.

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria Recap the learning from the last lesson.
Using a Binary Tree on the Computer	Display slide 4 . Open the selected 2Question database. Explain each of the children or animals has been given a name. Use the 2Question binary tree to find out the names. With the children look at how it works.
Finding Names	Display slide 5 . Hand out the question sheets. Choose an avatar or animal and then work through the database to find out the name.

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Activity 1: Using a 2Question binary tree	Display slide 6 . Children should use the database to work out the names of the different children\animals.
Checking Answers	Display slide 7 . Collect the class together and discuss the correct answers. Clicking reveals the answers one-by-one. A copy of the answers is provided for you at the end of this document.
Questions that cannot be Answered Using a Binary Tree	Display slide 8 . Discuss with the class the limitations of the information in 2Question: Questions are limited to 'yes' and 'no' answers; we are unable to ask questions such as 'children wearing a sweater and glasses' or 'animals with no legs and a shell'. What other questions could not be answered using 2Question?
Activity 2: Debugging Challenge	Display slide 9 . Children should open the Debugging 2Question from their 2Dos. Explain that it is not working correctly. Can they debug the database and make it work correctly? The errors are. <ul style="list-style-type: none"> • Orange and Peach results have been swapped over. • The images for Banana and Pineapple are mixed up. • The image for pear has been misinterpreted.
Review Success Criteria	Display slide 10 . Review the success criteria from slide 3 . Children could rate how well they achieved this using a show of hands.



Lesson 5 – Using 2Investigate: a Non-Binary Database.

Aims

- To use a database to answer more complex search questions.
- To use the Search tool to find information.

Success criteria

- Children understand what is meant by a database.
- Children have used a database to answer simple and more complex search questions.

Resources

Unless otherwise stated, all resources can be found on the [main unit 2.4 page](#). From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- [2Investigate – Avatars Database](#) set the database as a 2Do for the class.
- [Avatars Database Questions](#). Print a copy for each child. There are two sets of questions. Sheet 1 are simple searches and Sheet 2 involves more complex searches. Answers can be found at the end of this document.

Activities

Introduction	Display slide 2 and outline the lesson aims. Display slide 3 and outline the success criteria With the class, recap the limitations of the questions we can ask about information stored in a binary tree.
Introducing a Database	Display slide 4 . Explain that, this time, we are going to look at a database that allows us to ask more than one question. Open the 2Investigate database by clicking the icon.
How Information is Recorded	Display slide 5 . Show the record and look at how the information is stored. Clicking reveals more information.
Using the 'FIND' Tool.	Display slide 6 . Show the children how to use the Find tool. Explain we can search by more than one criterion. E.g., ginger hair and glasses. Clicking reveals more information.

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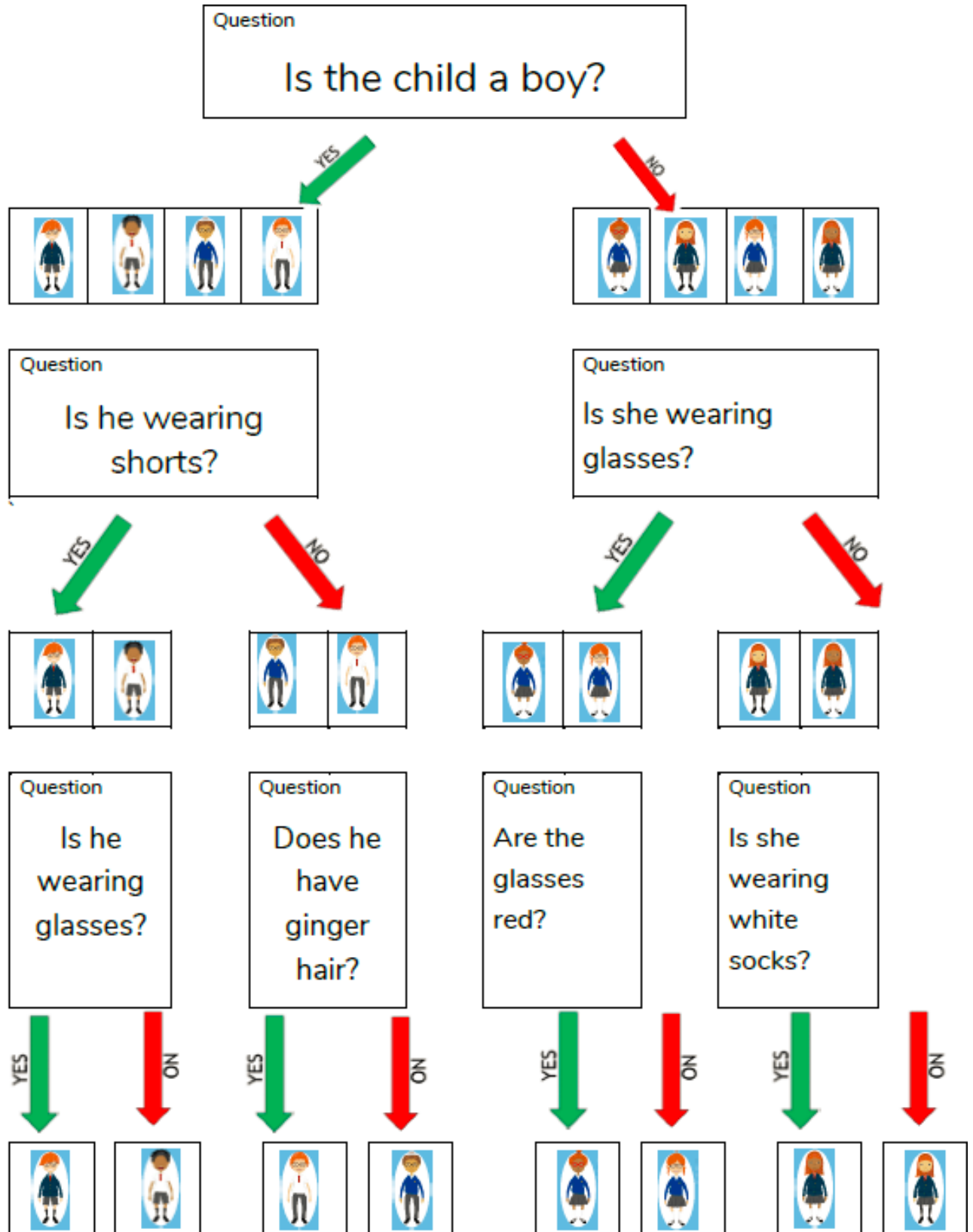


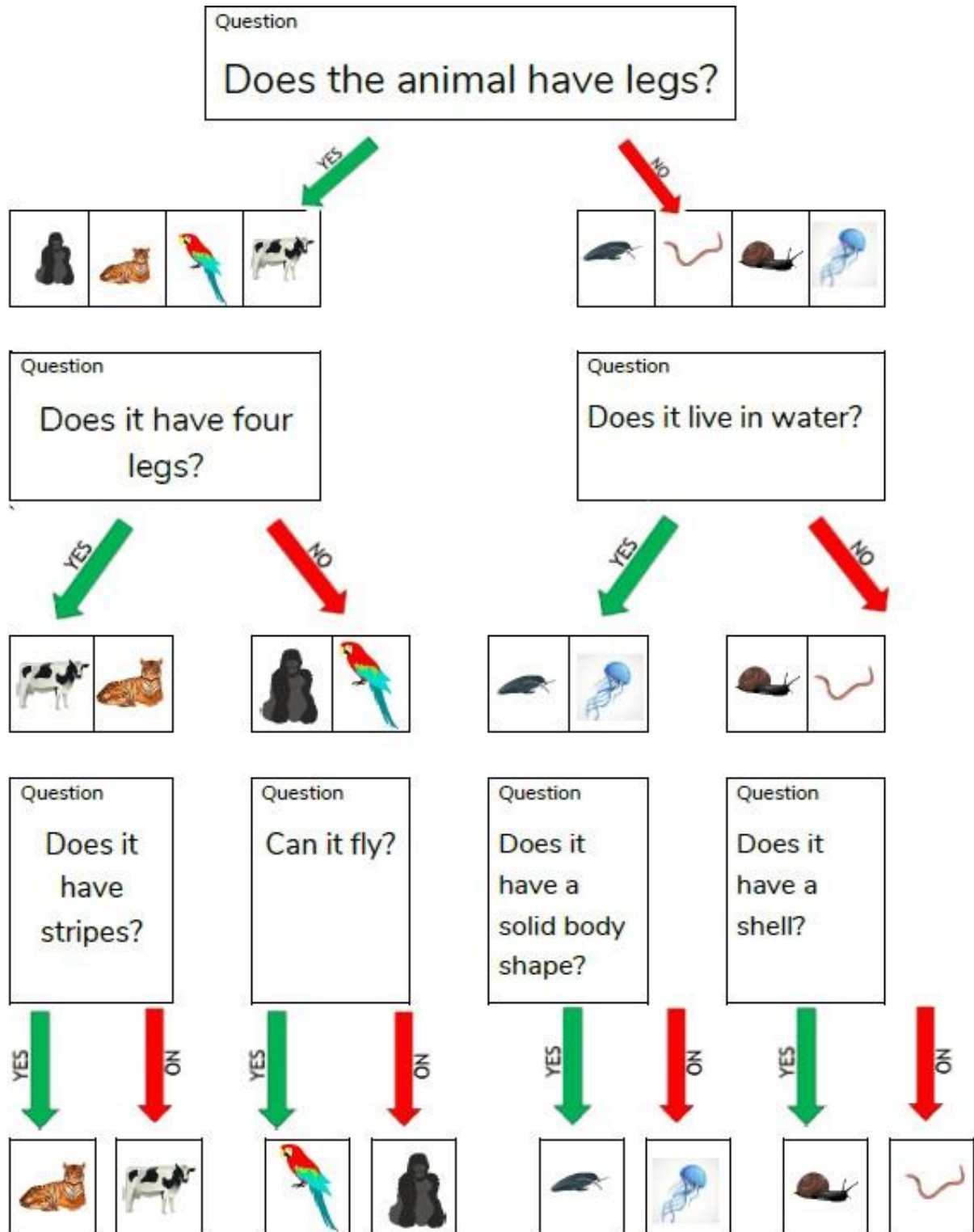


Activity 1: Using a Database to Answer Questions.	Display slide 7 . Hand out the question sheets . Children should open the database from their 2Dos and use it to answer the questions
Activity 2: Extension – Fruit database	Display slide 8 . Open the 2Investigate tool and then the 'Fruit' database and answer the questions using the 'Find' option to help discover the answers. If the children finish, can they write some questions about the database for their peers to answer? Answers are displayed one at a time on slide 9 .
Review Success Criteria	Display slide 10 . Review the success criteria from slide 3 . Children could rate how well they achieved this using a show of hands.

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Jasper



Chantelle



Fatima



Daniel



Matty



Philip



Karisha



Raj



Katie



Sammy



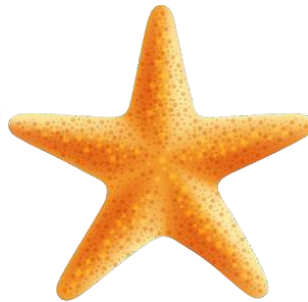
Sarah



Molly



Use 2Question to find the names of these animals.



Hilary

Perkins

Ashley

Francis

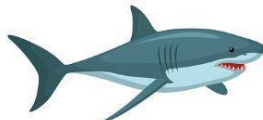


Ethel

Janvey

Maria

Verity



Jojo

Saul

Humphrey

Emma

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Avatars Database Answers

Question sheet 1: Getting started with simple searches

1. How many children are there in the class?

12

2. Which pupils in our class have blonde hair?

2

3. How many pupils are wearing a tie?

6

4. How many pupils are wearing a blazer?

4

5. How many pupils have glasses on?

7

6. How many pupils are wearing shorts?

3

7. Which child is wearing a T-shirt?

Matty

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Avatars Database Answers

Question sheet 2: Moving on with more complicated searches

1. What are the names of the boys wearing glasses?

Jasper, Philip, Raj and Sammy

2. Which pupils are wearing a tie and a blazer?

Jasper, Fatima, Karisha and Sammy

3. How many blonde pupils are wearing glasses?

1

4. How many pupils are wearing a blazer or a shirt?

7

5. How many pupils have ginger or brown hair?

6

6. Who is wearing a shirt and glasses?

Philip

7. Which pupils are wearing a blazer and are not wearing glasses

Fatima and Karisha

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Assessment Guidance

The unit overview for Year 2 contains details of national curricula mapped to the Purple Mash Units. The following information is an exemplar of what a child at an expected level would be able to demonstrate when completing this unit with additional exemplars to demonstrate how this would vary for a child with emerging or exceeding achievements.

Assessment Guidance	
Emerging	<p>With support, children can create basic pictograms using 2Count to represent a simple data set (Unit 2.4 Lesson 1). Children may need concrete representation to understand how to organise and search for data.</p> <p>With support, this physical representation can then be transferred into 2Investigate and used to answer simple questions on a data set (Unit 2.4 Lesson 5).</p> <p>Using 2Question, children use a binary tree to sort information and can manipulate their data, answering questions relating to this (Unit 2.4 Lesson 4).</p> <p>With support, children can store and retrieve data throughout Unit 2.4.</p>
Expected	<p>Using 2Count, children can create pictograms to represent data (Unit 2.4 Lesson 1).</p> <p>Children demonstrate their ability to organise data using a database in 2Investigate and can run simple searches on their data set (Unit 2.4 Lesson 5).</p> <p>Using 2Question, children use a binary tree to sort information and can manipulate their data, answering questions relating to this (Unit 2.4 Lesson 4).</p> <p>Children will store and retrieve data throughout Unit 2.4.</p> <p>Most children will be able to design their own physical binary tree to sort pictures of children (Unit 2.4 Lesson 3). They will be able to apply this skill into using 2Question to answer questions.</p> <p>Most children can design a binary tree using 2Question to sort pictures (Unit 2.4. Lesson 3). They can use their own created binary trees to support the answering of related questions to the data (Unit 2.4. Lesson 5).</p>
Exceeding	<p>Using 2Count, children can create pictograms to represent data (Unit 2.4 Lesson 1).</p> <p>Children demonstrate their ability to organise data using a database in 2Investigate and can run complex searches on their data set (Unit 2.4 Lesson 5).</p> <p>Using 2Question, children use a binary tree to sort information and can manipulate their data, answering questions relating to this (Unit 2.4 Lesson 4).</p> <p>Children will store and retrieve data throughout Unit 2.4.</p> <p>Children demonstrating greater depth can create their own questions using the data and will use skills covered in other units to assist with this.</p>

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