



# Roald Dahl Stories Lesson Ideas



## Density Dilemma with Jon Chase

**TEACHER RESOURCE PACK**

# Density Dilemma



Find out all about density with a fabulous fruit floating experiment and stretch the imaginations with a fruit-flying invention, inspired by *James and the Giant Peach*.

**Learning Objective:** To develop understanding of the meaning of density

**Learning Objective:** To explore what fruit will float or sink depending on the density through an experiment, capturing outcomes in a chart

**Learning Objective:** To develop thinking skills by inventing a way to make a giant piece of fruit fly

## Overview

Children will watch the video experiment and gain an understanding of density and what happens to objects in water, using the story of *James and the Giant Peach* as a springboard for learning. They will be challenged to carry out their own fruit experiment and invent a way for fruit to fly.

If teachers would like to give additional context, a read aloud of an extract from the book is available to watch here: [puffinschools.co.uk/resources/video-resource-density-dilemma-with-jon-chase](http://puffinschools.co.uk/resources/video-resource-density-dilemma-with-jon-chase) or a print version is included within this booklet and can be read to the class before starting. The activities in this lesson would suit children working in pairs and support:

SCIENCE

LITERACY

CRITICAL  
THINKING

COMMUNICATION  
SKILLS

### Activities include:

1. Action stations!  
Floating fruit experiment
2. Flying fruit challenge.  
Invention test

### You will need:

- The video featuring the density experiment
- Five pieces of fruit in bowls for each pair of children (either brought in by children or provided by teachers; fruit needs to be able to fit in a standard sized jug and could include apples, clementines, plums, lemons, even blueberries!)
- Jugs of water (one between two)
- Salt (enough for a dessert spoon each)
- Spoons (one between two)
- Paper towels
- Printed resource templates
- Pens or pencils
- A helium balloon (optional activity)



# Density Dilemma



## Starter

Invite children to recall what they saw in the video and share what they learnt about density. Can they remember what happened to the peach in the water? Why did this happen? Elicit that density means how much stuff there is in an amount of space. When there is a lot of stuff squashed into one space, this means it is really dense. But if only a small amount of stuff is squashed into the same space it will be really light. Can they think whether the peach was more or less dense than water? Remind them that if something is denser than water it will sink. If something is less dense than water, it will float. Now would be a good moment to read the extract from the story for additional context, if you haven't already.

## MAIN ACTIVITIES

### Task one

Invite children to share what their favourite fruit is. Do they know any others? Share with them that they will be carrying out their own fruit experiment, using a variety of different fruits and recreating the experiment they saw in the video. Can they find out which fruit floats and which fruit sinks?

They now need to carefully set up their experiment on their table, with the appropriate equipment. Remind children that they need to be careful to ensure their experiment runs smoothly and so their results are not affected. (It is also a good idea to remind them that the fruit is not for eating!). You will need a copy of **Resource 1: 'Action stations!'** with the fruit chart template for each child. Working in pairs children need to 'test' their fruit one at a time, to see which floats and which does not, noting down the results on their fruit chart and stating whether the fruit is more or less dense than water.

Think back to the story about James and his fruit adventures! Can children recall what happened to the giant peach? If James had been able to study floating fruit, do children think he would have still tried to save the peach? Have a class vote to see what they all think!

### Optional activities

Balloon activity - as a class teachers could explore which fruit will 'fly' with a helium balloon, as featured in the video. Remind children that helium is less dense than the air around it, which means it will float. But what happens when you add a 'weight' to it in the form of a fruit? Children could be invited to select a number of fruits to test the theory, with the activity led by the teacher. A helium balloon would be needed and mechanism to attach it to each piece of fruit (i.e. string and a paper clip).

Fruit salad – the remaining fruit could now be washed and used to make a fruit salad using the recipe in this resource pack.

### Task two

Ask children how James helped save the peach from sinking and being eaten by sharks. Elicit that he came up with the idea of seagulls pulling the peach into the sky and making it fly. As the video demonstrated, in reality if a peach was really that big it would need 2.5 million seagulls to make it fly! **Using Resource 2: Flying Fruit** challenge children to come up with an inventive way to make a giant fruit of their choice fly. They need to think like James did and use their imaginations and inventiveness to help them design a way to make their fruit fly. This does not have to be using something real like seagulls; they can let their imaginations go and be really creative.

Allow them to discuss different ideas in pairs or you might like to hold a class brainstorm before they complete this task independently. Remind children that any ideas are welcome!

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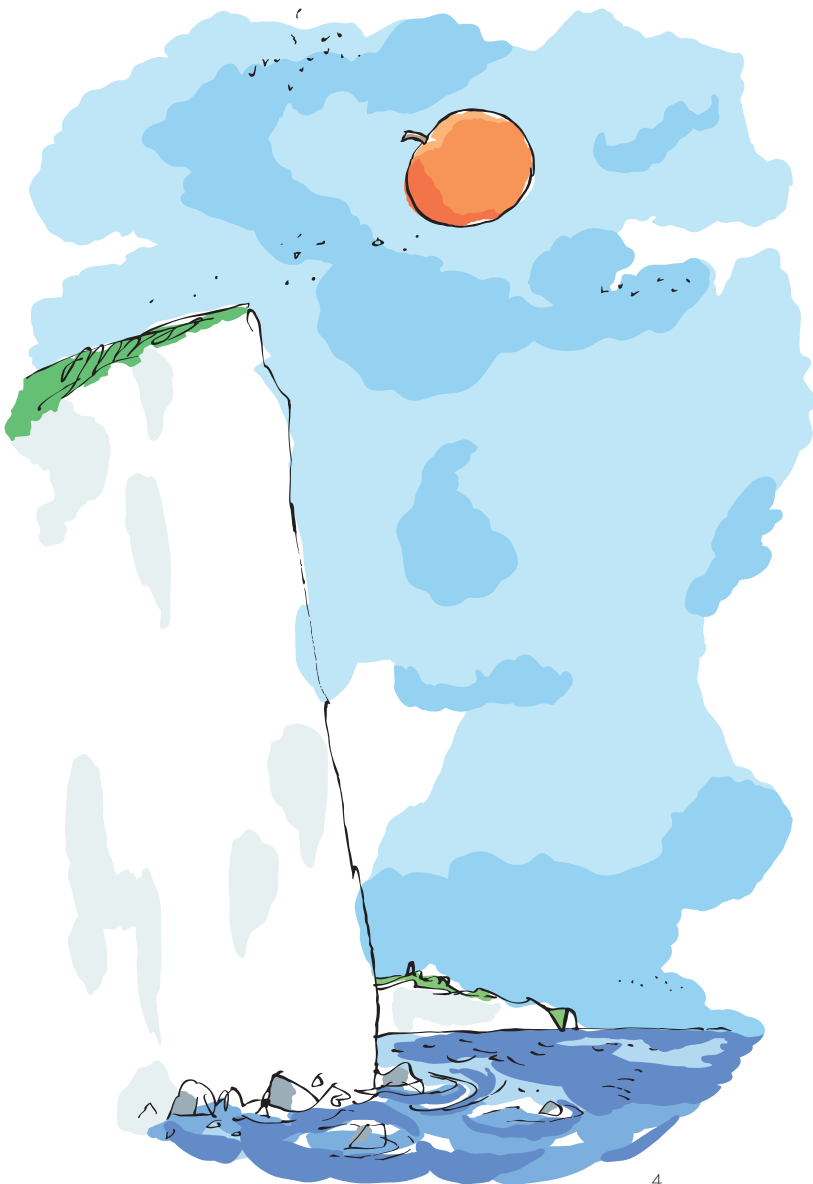
## **Optional discussion activity**

Invite children to think about what would have happened if James had not made the choice to take action and save the peach! Why did he do it? Elicit that without James showing kindness and bravery, the peach would have been eaten by sharks, along with the insects and James too! All our actions have consequences, good and bad. Just like in a science experiment, there will always be an outcome or result for every action. Can children think of times they have made choices that have had specific consequences, good or bad? How can they make sure the choices they make are good like James? Share ideas as a class of how to encourage good choices.

## **Plenary**

Invite children to share the results of their experiment. Are they surprised at the results? Which fruit surprised them the most? Can they explain why the fruit did or did not float in relation to density? Remind them that if something is more dense than water it will sink and if it is less dense than water it will float.

Move on to discussing their ideas and inventions for making their fruit of choice fly and invite them to think about which ideas would be most likely to work. Remind them that science experiments are useful in helping test ideas, but the magic of stories allows us to be really inventive even if in real life it might not work!



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## EXTRACT: JAMES AND THE GIANT PEACH

‘There is something that I believe we might try,’ James Henry Trotter said slowly. ‘I’m not saying it’ll work...’

‘Tell us!’ cried the Earthworm. ‘Tell us quick!’

‘We’ll try anything you say!’ said the Centipede. ‘But hurry, hurry, hurry!’

‘Be quiet and let the boy speak!’ said the Ladybird. ‘Go on, James.’

They all moved a little closer to him. There was a longish pause.

‘Go on!’ they cried frantically. ‘Go on!’

And all the time while they were waiting they could hear the sharks thrashing around in the water below them. It was enough to make anyone frantic.

‘Come on, James,’ the Ladybird said, coaxing him.

‘I... I... I’m afraid it’s no good after all,’ James murmured, shaking his head. ‘I’m terribly sorry. I forgot. We don’t have any string. We’d need hundreds of yards of string to make this work.’

‘What sort of string?’ asked the Old-Green- Grasshopper sharply.

‘Any sort, just so long as it’s strong.’

‘But my dear boy, that’s exactly what we do have! We’ve got all you want!’

‘How? Where?’

‘The Silkworm!’ cried the Old-Green- Grasshopper. ‘Didn’t you ever notice the Silkworm? She’s still downstairs! She never moves! She just lies there sleeping all day long, but we can easily wake her up and make her spin!’

‘And what about me, may I ask?’ said Miss Spider. ‘I can spin just as well as any Silkworm. What’s more, I can spin patterns.’

‘Can you make enough between you?’ asked James.

‘As much as you want.’

‘And quickly?’

‘Of course! Of course!’

‘And would it be strong?’

‘The strongest there is! It’s as thick as your finger! But why? What are you going to do?’

‘I’m going to lift this peach clear out of the water!’ James announced firmly.

‘That’s absurd!’ cried the Earthworm.

‘It’s our only chance.’

‘He must be joking.’

‘Go on, James,’ the Ladybird said gently. ‘How are you going to do it?’

‘Skyhooks, I suppose,’ jeered the Centipede.

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‘Seagulls,’ James answered calmly. ‘The place is full of them. Look up there!’

They all looked up and saw a great mass of seagulls wheeling round and round in the sky.

‘I’m going to take a long silk string,’ James went on, ‘and I’m going to loop one end of it round a seagull’s neck. And then I’m going to tie the other end to the stem of the peach.’ He pointed to the peach stem, which was standing up like a short thick mast in the middle of the deck.

‘Then I’m going to get another seagull and do the same thing again, then another and another –’

‘Ridiculous!’ they shouted.

‘Absurd!’

‘Poppycock!’

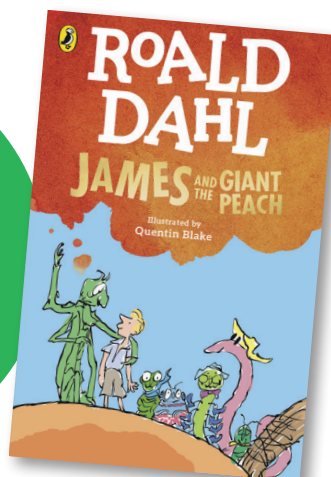
‘Balderdash!’

‘Preposterous!’

And the Old-Green-Grasshopper said, ‘How can a few seagulls lift an enormous thing like this up into the air, and all of us as well? It would take hundreds . . . thousands . . .’

‘There is no shortage of seagulls,’ James answered. ‘Look for yourself. We’ll probably need four hundred, five hundred, six hundred . . . maybe even a thousand . . . I don’t know . . . I shall simply go on hooking them up to the stem until we have enough to lift us. They’ll be bound to lift us in the end. It’s like balloons. You give someone enough balloons to hold, I mean really enough, then up they go. And a seagull has far more lifting power than a balloon. If only we have the time to do it. If only we are not sunk first by those awful sharks . . .’

**FIND THIS IN  
CHAPTER 20 OF  
JAMES AND THE  
GIANT PEACH**



# Density Dilemma



## RESOURCE 1: ACTION STATIONS!

Welcome to the wonderful world of FRUIT! You are going to find out which fruit floats and which fruit sinks, in your very own density experiment! You are going to answer the question:

‘Is the fruit more dense than water or less dense than water?’

**Step 1** Set up your experiment table – make sure it’s clear of clutter and that you have paper towels on hand to mop up any splashes!

**Step 2** Have your fruit on the table in the bowl, ready to use

**Step 3** Fill a jug with water to  $\frac{3}{4}$  full.

**Step 4** Add a spoonful of salt and stir the water

**Step 5** One at a time, take each piece of fruit and place it in the jug of water. Does it float or sink?

**Step 6** Make a note of what happens on your fruit chart – the first line has been done for you as an example

Type of fruit	FLOAT	SINK	More or less dense
Peach	✓		Less

Write about the experiment including what you did and what the results were (which fruit floated and which did not) and what this tells you about their density:

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# Density Dilemma



## RESOURCE 2: FLYING FRUIT CHALLENGE – INVENTION TEST

As you heard in the video, it was James' idea that helped saved the peach in the story! You also heard how many seagulls it would REALLY take to make a giant peach fly – 2.5 million!

But how would YOU make fruit fly?

Choose a piece of fruit from your density experiment. Imagine it has GROWN to the size of 80 elephants like James' peach. How would you make it fly?

Just like James, how **inventive** can you be? Maybe you can make your piece of fruit GROW magical wings and fly all by itself! Maybe you can invent your own flying machine! You don't have to use something real; let your imagination go WILD!

Draw your ideas in the space below and add instructions or labels to show how you would make your fruit fly.

Share your ideas with your classmates. Whose ideas are the most inventive and imaginative?  
Do you think the fruit could really fly?!

### OPTIONAL ACTIVITIES: FRUIT GLORIOUS FRUIT!

Now you've finished your experiment, what better way to celebrate than using your fruit to make a fruit salad. YUM! Peel, segment and slice all the fruit into similar sized pieces before dressing with orange juice.  
*Teachers will need to take necessary precautions around using kitchen implements in the classroom.*