TEACHING GUIDE

For ages 3 to 6 years

English • STEM • Environment • Social Studies • Citizenship
Engage
LEARNING
Vol. 1, Issue 1, Level 1

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Dear Educator,

Welcome to the first issue of *Engage*, a classroom magazine for students from pre-K through Class 6. Depending on the grade level you teach, *Engage* has four reading levels. Since all levels carry the same articles, adjusted for appropriate content load and reading level, you can mix and match levels, or use just one level. All the levels will engage your students with great nonfiction content.

Each of the six annual issues will take your students on amazing adventures around the world. Join scientists as they advance our knowledge of the world and its cultures. Each article is correlated to your curriculum. You can use the articles to engage students in learning or to review what you have already taught them.

The Teaching Guide provides a framework you can use to teach these articles and link them to your curriculum. They can be used for whole-class, small-group and individual instruction.

Each lesson develops students' ELA skills and teaches science concepts. Use all the lessons, activities and worksheets, or pick and choose the ones appropriate to your teaching style.

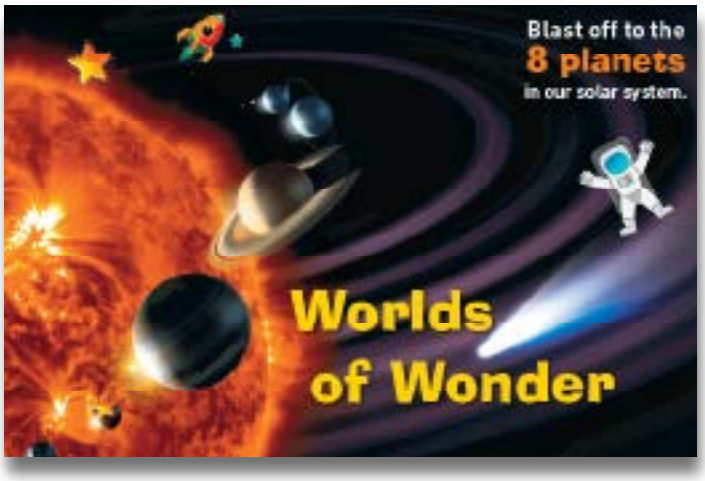
MEET THESE STANDARDS

- ✓ **Space Science**: Understand that eight planets make up the solar system, and each planet has its own characteristics.
- ✓ **Life Science**: Understand that bees are important for pollination.
- ✓ **Life Science**: Understand that adaptations are traits that help animals survive.
- ✓ **Language Arts**: Read simple sentences.
- ✓ **Language Arts**: Learn new science content words.
- ✓ **Language Arts**: Read and comprehend text.
- ✓ **Mathematics**: Understand the versatility of the hexagon shape.

WORLDS OF WONDER

LANGUAGE ARTS STANDARDS
Students will be able to read simple sentences.

SCIENCE STANDARDS
Students will be able to name the planets in our solar system and compare their characteristics.



BEFORE READING
BUILD BACKGROUND

- *Engage* in a conversation with the children about the place they live in. Ask children about their house name, road name, their city /state and country. Probe further by asking them to name the continent they live on and whether they know the name of the planet they live on.

- Tell them that just as we fit into this world/planet our planet earth belongs to one large family called the solar system.

- Explain: There are 8 planets in the solar system and our planet Earth is one of them.

- Elicit responses about the other planets of the solar system (if they know).

- After the discussion, conduct the following activity.

ACTIVITY: MY PLACE IN THE SOLAR SYSTEM

You need:
7- 8 pre-labelled or unlabelled (depending on students' ability) concentric circles for students to cut out and decorate. The rings should be labeled with the name of the students' house, street, town, state, country, continent, planet and solar system.

To do:
— Give each student one circle cut-out at a time. Ask them to stick a picture (as shown in the reference image) or draw on each circle.
— Children should begin by drawing a house, and label it 'My house'.
— After they draw their house, pass on other concentric circles and cut outs of my city/town, my state, my country, my continent, the Earth, the solar system.
— Children then colour in the provided cut-outs, stick them on the concentric circles and connect them with a thread or ring in order from smallest to largest.
— Display their creations on the bulletin board.

READY TO READ
Hand out copies of *Engage* and have students turn to page 2.

- Invite students to read the headline and deck of the story in the magazine. Then look at the photos and read the captions. Ask them to predict what the story is about.
- Read each line with correct intonation and pitch. Instruct students to follow the reading by tracking it with their fingers. Ask them to repeat after you.
- Have them recall the names of all the planets.

AFTER READING: EXTENSION ACTIVITIES

LANGUAGE ARTS CONNECTION

SESSION FOCUS: BUILD WORD POWER

Create a Word Wall for students to read by writing the following words on chart paper:. Planet; Smallest; Hottest; Largest; Storms; Clouds.

SESSION FOCUS: NAMES OF PLANETS

Learning Outcome

Students learn how to spell the names of the planets.

You need:

Prints of names of each planet on a card, glue each card to an ice-cream stick to make a poster. Depending on students' ability, they can do this. Split the class into groups of 4 and give one set of 8 posters to each group.

To do:

— Quiz students by giving clues for each planet. For example, a planet that begins with the letter 's' or the planet that ends with the sound 'th'.
— Instruct students to hold up the poster with the correct planet name.

Follow up Activity:

End this part of the session by having students complete the worksheet 'Solar System Scramble'. Let them refer to their copies of *Engage* magazine as they complete the worksheet..

Memory Booster

Use the mnemonic 'My Very Elegant Mother Just Served Us Noodles' to help children remember the order of the planets from the Sun.

STEM CONNECTION

SESSION FOCUS: SHAPE, SIZE AND COLOUR OF PLANETS

Learning Outcome

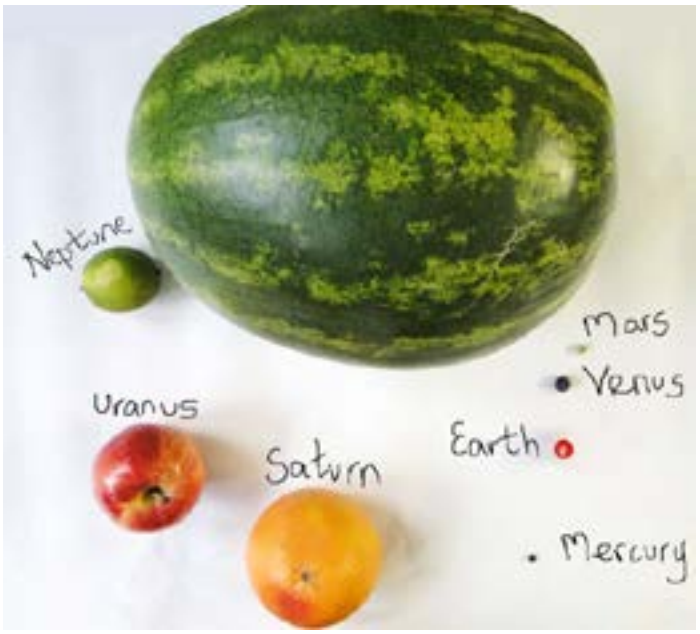
Students learn how to spell the names of the planets.

- Reread pages 2–11 from the magazine. Focus on pronunciation and voice modulation. Ask students to repeat each line after you while they follow the words and sentences by tracking them with their fingers.
- Pause after each page and ask them to observe the colour of the planets and how each planet is different. For example: Earth is the planet we live on. It has water so it looks blue. Mars has red dust and strong winds blow the dust into the planet's sky, making it look pink.
- Ask students to look at the pictures and identify the colour of each planet.
- Do a quick comprehension check by asking students questions like:. What shape are the planets? (*round like a ball*); Which planet has rings around it? (*Saturn*); Which is the largest planet? (*Jupiter*); Which is the planet we live on? (*Earth*). Planets are spherical in shape.

ACTIVITY 1: PLANET SIZES

Learning Outcome

Students learn about the comparative size of planets.



You need:

To model the planets, use various round objects, such as balls and fruits. as suggested: A big yellow ball for the Sun; a pea for Mercury; two plums for Venus and Earth; a raspberry for Mars; a watermelon for Jupiter; a cantaloupe/ muskmelon for Saturn; and two oranges for Uranus and Neptune. Remind students that the models show relative size and not shape.

To do:

— Label each planet and the sun.
— ***Ask***: Which planet is the biggest? the smallest? List two or three planets and have them describe which is the biggest or smallest. After students

have understood the size of the planets they can place them on the basis of distance from the sun.

Follow up Activity:
End this part of the session by having students complete the 'Colour the Planets' worksheet.

SCIENCE CONNECTION

SESSION FOCUS: PLANETS GO AROUND THE SUN

Learning Outcome

Students learn how planets orbit the sun.

- Explain to students that Earth goes around the sun. The path on which Earth moves is called an orbit.

- Draw an orbit on the floor with chalk and demonstrate to students how Earth goes around the sun while having one of them walk along the path you drew. Explain that Earth always stays on its path. Each planet has its own path around the sun. The path is called an orbit. One orbit is a year on each planet. A year on Earth is 365 days.

- Tell students that the planets also spin like a top. The spinning motion causes day and night. One spin around defines a whole day on the planet. A day on Earth is 24 hours long.

- Have each student show these two motions by spinning like a top as they walk on the path you drew.

- Then have students do the following activity.

You need:

1. Modelling play dough to make a model of a planet and the sun
2. Pie plates or a plates with a raised edge

To do:

— They can stick red play dough to represent the Sun in the centre of the plate (as shown in the image).
— Students can then roll a planet around in the plate, keeping it next to the edge.
— Explain that this is how planets orbit or go around the sun.
— After the activity show children this video: https://www.youtube.com/watch?v=xKKzIoJgMSQ
— After viewing the video, ask children to recall the planets of the solar system.

Name _____ Date _____

SOLAR SYSTEM SCRAMBLE

Unscramble the words to identify the names of the planets of the solar system.

HINT: Look at the boxes carefully. Each box is shaped as per the shape of the letters in the planet name.

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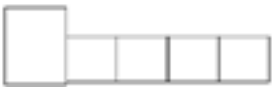
Vsneu



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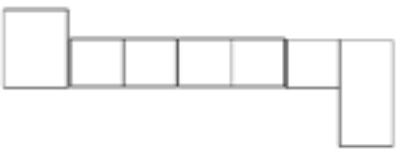

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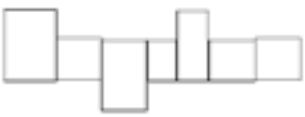

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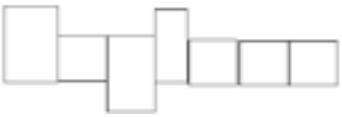


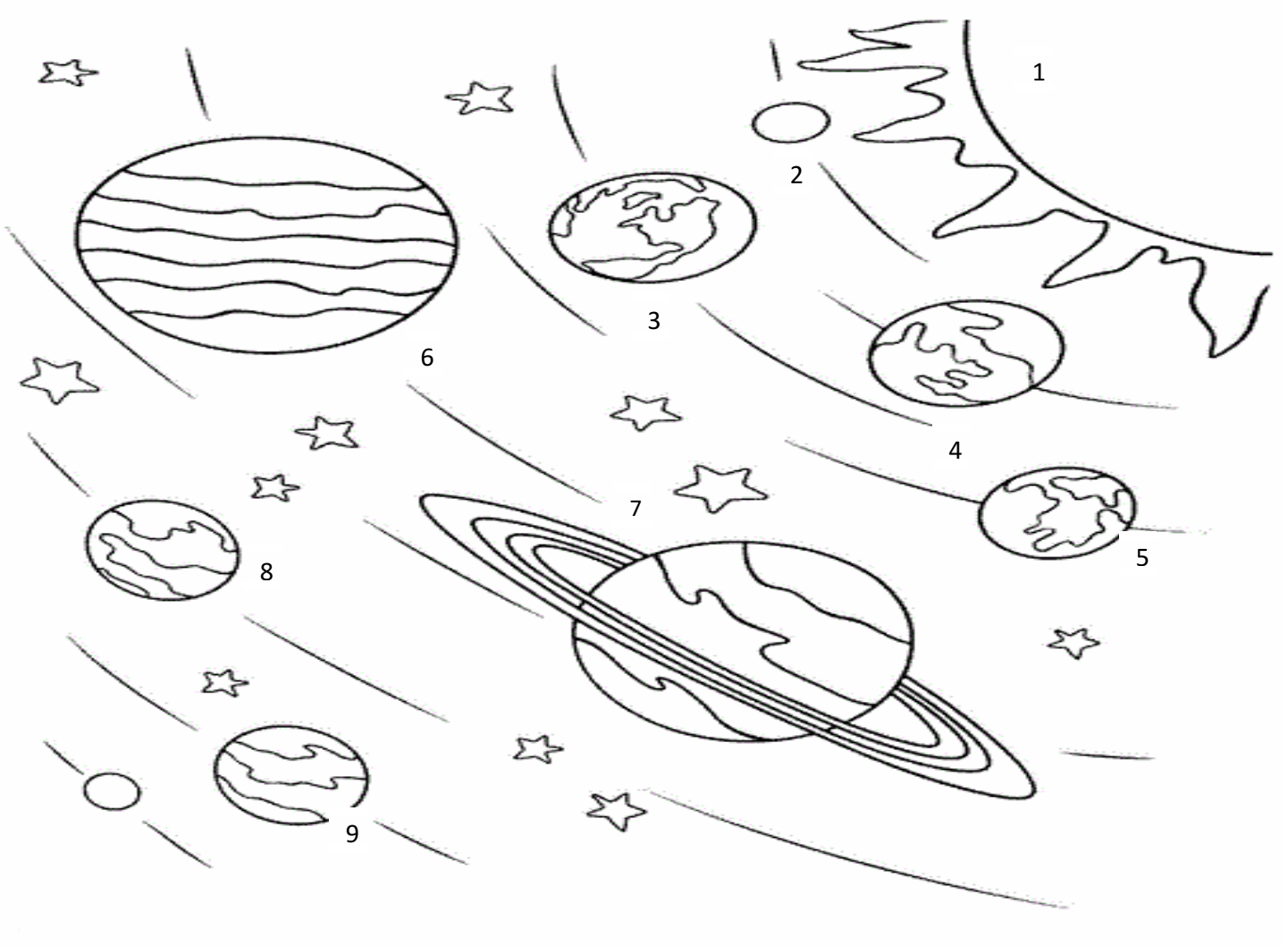
Name _____ Date _____

COLOURING FUN

Use the colour code to colour each planet of the Solar system. Colour the stars silver and the sky black.

Sun	**Mercury**	**Venus**	**Earth**	**Mars**
1 Orange	2 Grey	3 Yellow	4 Blue	5 Red

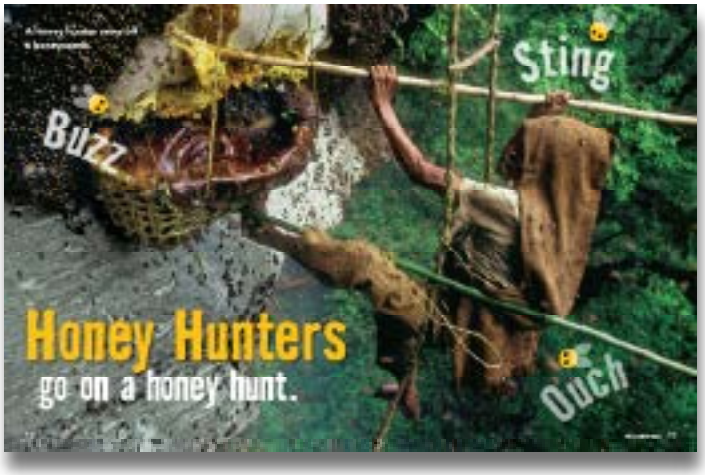
Jupiter	**Saturn**	**Uranus**	**Neptune**
6 Brown	7 Light Blue	8 Green	9 Dark Blue



THE HONEY HUNTERS

LANGUAGE ARTS STANDARDS
Students learn new content words.

SCIENCE STANDARDS
Students learn about pollination and how bees make honey.



BEFORE READING

BUILD BACKGROUND

- Read to the class a poem about bees and pollination. You will find several poems on this website: http://www.canteach.ca/elementary/songspoems53.html. You might read the first one, titled 'Bee'.

- Ask students to repeat the poem after you. Then ask them the following questions:
  1. Have you seen a honeybee? Where?
  2. What sound does the bee make?
  3. What do bees make?
  4. What is the structure in which a honeybee lives called?
  5. What is nectar?

- Explain that bees have a straw-like, long and sticky tube with which they collect nectar from flowers. This tube is called a proboscis. Bees store the nectar in a part of their body called the honey sac. They take the honey to their hive. In the hive, some of the bees mix the nectar with chemicals from their bodies and put it into a honeycomb. Then they flap their wings quickly. Wind from the wings dries out the honey. This is how honey is made. Then the bees seal in the honey with beeswax.

- Point out that while collecting nectar, honeybees pollinate flowers. They carry pollen from one flower to another. This pollen is then used by the other flower to make seeds and grow more plants. Without honeybees we would not have many fruits and vegetables.

BUILD WORD POWER

- Prepare flash cards for the following content words and flash them for students to read: honey, bee, beehive, honeycomb, nectar, pollen. Repeat until students can sight-read each word.

- Display the words on the soft board to build the word wall.

- Add more words like ladder, hunter and sting after reading the story.

READY TO READ

Hand out copies of *Engage* and have students turn to page 12.

- Direct students' attention to the photo on the spread and ask them to identify the image. Tell them that the man is called a Gurung. The Gurung are a people from Tibet. Long ago, some Gurung moved to Nepal, where the man lives. The Gurung are also called honey hunters.

- Read pages 14–18 slowly with correct intonation. Children must follow the reading by tracking it with their fingers.

- After reading, ask the following questions
  1. Where do the Gurung live and what do they do?
  2. Do you think it is difficult to climb on high mountains?
  3. Have you been on a mountain trek?

- Discuss how the life of the Gurung is different from the lives of your students.

- Focus on how some people get vegetables and fruits from a market, and how others grow, forage, and hunt for food.

Follow up Activity:
End this part of the lesson by having students look for words in the 'Spell Hunter' worksheet.

AFTER READING: EXTENSION ACTIVITIES

STEM CONNECTION

SESSION FOCUS: PROBOSCIS

Learning Outcome

Students understand how a bee sucks nectar from a flower.

You need:

1. A cup filled with any sweet juice
2. Straw (one for each child)
3. A flower cut-out with a hole in the centre to insert straw
4. Bee head gear

To do:

— Place the paper flower cut out on top of the glass filled with juice.
— Insert the straw in the hole.
— Now invite a child at the activity centre. have the student wear the bee head gear and ask him or her to suck the juice from the glass.
— Show children the video https://www.youtube.com/watch?v=rUsTmPZnFlA to show how a bee sucks honey.
— Explain that the proboscis is like a straw. Bees have mouths like this to suck nectar from flowers.

CITIZENSHIP CONNECTION

SESSION FOCUS: THE BEE FAMILY

Learning Outcome

Children will be able to identify different types of bees and their roles.

- Discuss the role of each member of the bee family. The Bee family has 3 types of bees: the queen bee, drones and the worker bees.

- The worker bees are mostly females. They clean, repair and defend the hive, and also feed royal jelly to the queen bee. They build the honeycomb from wax and gather nectar, pollen and water. The queen bee's job is to lay eggs. The drones give eggs to the queen bee.

- The worker bees live only for 5-6 weeks and each one produces upto a 12th of a teaspoon of honey. The queen bees live upto 5 years and can lay upto 2,500 eggs.

- They do the 'waggle dance' to tell other bees where the food source is. They move their bodies at an angle to show the direction of the food source.

- Discuss what different members of a bee community do.

- Discuss the various jobs people do in a community. Then ask how this helps everyone in the community. Be sure to include police, firefighters, as well as other workers.

- Then discuss the roles of members of their family at home and how they help each other. Ask students what they do to help around the house. Tell students that in the honey bee family even the youngest bee does some work. Similarly, they can also help by putting away their toys after playing, or helping lay the table etc.

- Discuss the various jobs that they could do in the house.

Follow up Activity:
End this part of the lesson by having students complete the 'The Busy Bee Family' worksheet.

MATHEMATICS CONNECTION:

SESSION FOCUS: THE SHAPE OF THE HONEYCOMB

Learning Outcome

Students identify the shape of a honeycomb.

- Show students what a honeycomb looks like.

- Tell them it has cells with six sides. This is a hexagon. The cells are close to one another.

- Draw a hexagon shape on the chalkboard and let students draw it on rough sheets of paper.

• They can draw a few hexagons close to each other to resemble a beehive. Once they have drawn their honeycombs, ask students to colour them.

ARTS CONNECTION

SESSION FOCUS: BUBBLE WRAP BEE HIVE

Learning Outcome

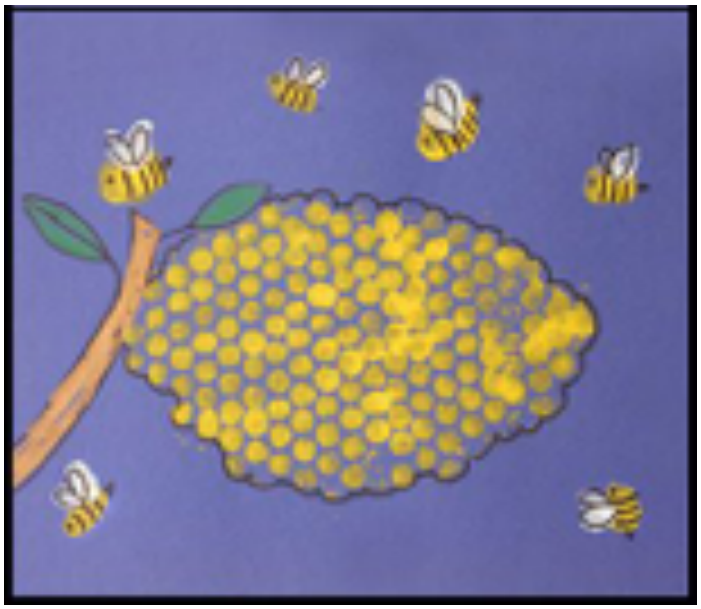
Students learn what a hexagon is.

You need:

1. A sheet of bubble wrap
2. Rolling pins
3. Yellow paint in a small plate
4. Sheets of art paper

To do:

— Give each student a rolling pin wrapped with bubble wrap sheet and ask him/her to roll it in yellow paint.
— Once it has enough paint on it, ask him/her to roll the rolling pin on a sheet of paper. This will give them a print which resembles a bee hive.
— Let it dry for a while and then ask students to cut the paper in the shape of a bee hive.
— Students can then stick the bee hive on another sheet of paper and draw bees, a tree or flowers around it.
— Ask students what shape makes up the hive.



LANGUAGE ARTS CONNECTION:

SESSION FOCUS: QUEEN BEE GAME

Learning Outcome

Students are able to spell content words.

• Have the children sit in a circle on the floor.

• Appoint a child to be 'the queen bee'.

• The queen bee walks around the circle tapping children on the head and saying, "Buzz, buzz, buzz", with each tap.

• Each child tapped spells the word asked by the teacher.

• If the child is unable to answer he/she gets out of the circle and follows the queen around.

• When the queen calls, "Go make honey" those tapped run off with the Queen bee to an empty spot. The last one to the spot is the new 'queen bee'.

MOVIE WATCH:

'Bee Movie' by DreamWorks Animation

Video Hub

Watch these exciting videos.

About Bees https://www.youtube.com/watch?v=dA05LOfPblY

How is Honey made https://www.youtube.com/watch?v=iT6IQx26eHk

How Honey is made https://www.youtube.com/watch?v=nZlEjDLJCmg

Family of Bees https://www.youtube.com/watch/?v=bArNmKbYVm8

Why do we need bees https://www.youtube.com/watch?v=mdfMkr1pXrM

What will happen if all bees die? https://www.youtube.com/watch?v=JilYBVrFiLA

Watch the movie 'Bee Movie' by Dreamworks Animation

Name _____ Date _____

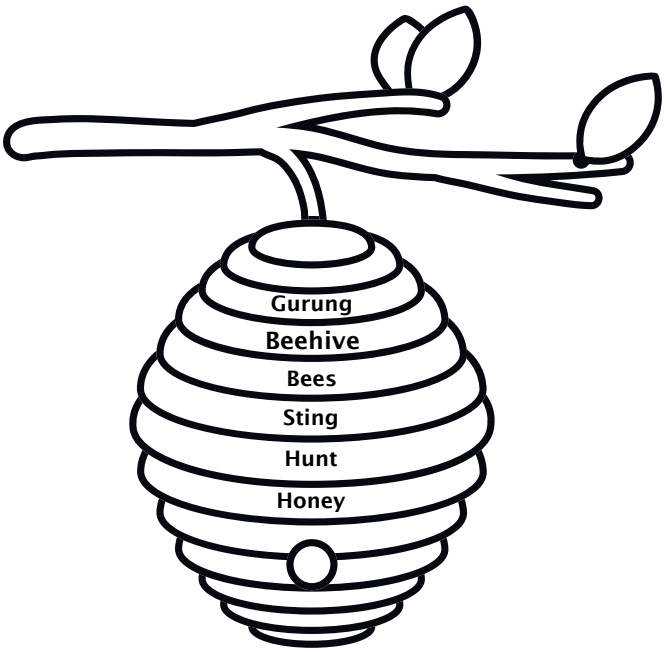
SPELL HUNTER

Hunt for the words given in the word bank in the grid below.
HINT: Words may be placed horizontally, vertically or diagonally.

A	U	G	U	R	U	N	G	I	X	C
A	B	E	E	S	Z	H	R	Y	U	Y
F	E	J	H	T	K	G	D	S	N	C
W	E	C	V	I	M	A	E	L	B	G
S	H	W	F	N	O	P	I	X	T	R
V	I	O	B	G	B	F	N	N	C	I
C	V	J	N	D	H	Y	U	K	V	J
X	E	C	N	E	S	H	R	T	U	A
A	S	F	T	H	Y	W	E	C	E	J

Word Bank

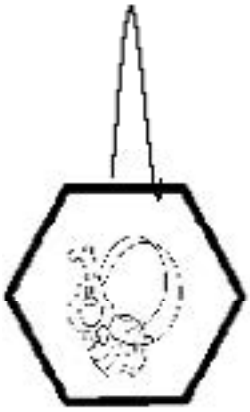
Find words from the story with two or more vowels to fill up the beehive



Name _____ Date _____

MEET THE BUSY BEE FAMILY

Match the picture of the bee to the task it performs.



The Drone

I give eggs to the queen bee.

I lay eggs and rule the hive.

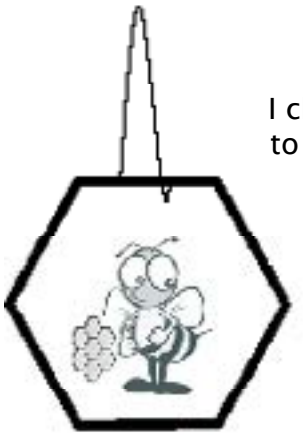
I build the comb and produce wax.

The Nanny

I guard the hive entrance.

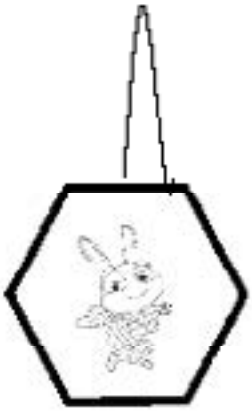
I feed royal jelly to the queen bee and feed the older larva honey and pollen.

I clean the cells to store honey.

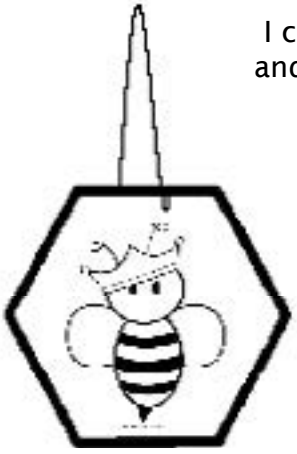


The Hive Builder

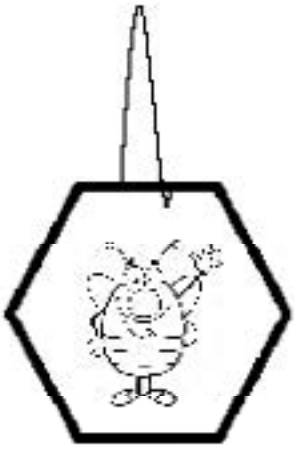
I collect nectar and pollen from flowers.



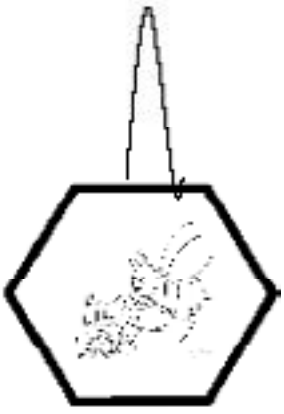
The Housekeeper



The Queen Bee



The Guard



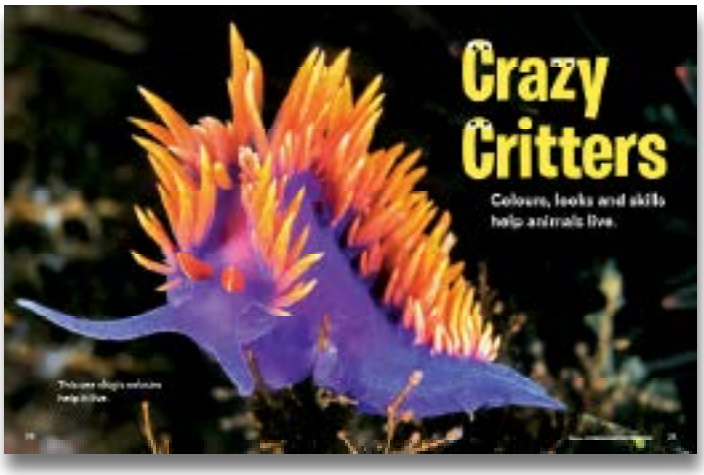
The Explorer

Fact File:
The Guard, the Explorer, the Nanny, the Hive Builder and the Housekeeper are all worker bees.

CRAZY CRITTERS

LANGUAGE ARTS STANDARDS
Students read and comprehend the text.

SCIENCE STANDARDS
Students explain that animals have traits to help them survive in their environments.



BEFORE READING

BUILD BACKGROUND

- Play a game of 'hide and go seek.' Appoint a student who is the 'catcher'. The 'catcher' shuts his or her eyes while all the other students hide.

- Tell children that they have to make sure that they are not seen by the 'catcher'.

- After the game ask children: What were the ways you hid so the 'catcher' couldn't find you?

- *Ask*: "Do you think animals play hide and go seek?" Why would animals want to hide? (Possible answer: *so that no one can eat or hunt them.*)

- Some animals eat/hunt other animals for food. They are known as predators. In order to protect themselves from predators, these animals hide. They hide by either blending in the environment or changing their body colour. The chameleon is one such animal. Even bright colours can help animals blend in. Take butterflies, for example. Brightly coloured butterflies blend in with bright flowers.

ACTIVITY: CAMOUFLAGE

You need:
Several colourful sheets of paper

To do:
— Cut the paper into small pieces.
— Take children to an open area, such as a garden. Scatter coloured paper on the ground.
— If the activity is conducted in the garden, you could hide the green paper amongst the leaves, brown ones in the mud, and some coloured ones amongst flowers. There should also be papers of different colours (for example, red, yellow, blue) that can be easily spotted.
— If the activity is conducted indoors, take some pieces of paper that match the flooring and others that are easy to find. Ask children to pick up as many pieces of paper as they can in 20 seconds.
— After the activity, ask students which papers they most easily found. Ask why? (*Because their colours are different than the environment in which they were placed.*)
— Ask students to find some papers that were difficult to spot. Ask why they were difficult to find. (*They blended into the environment.*)
— Similarly, animals blend into their environments so that they are not easily spotted by the predators. This is a trait called camouflage.

READY TO READ

Hand out copies of *Engage* and have students turn to page 24.

- Direct students' attention to the photo on the spread and ask them what it shows.

- Let students observe the colours of the sea slug. Ask them to guess where it lives and why it has beautiful colours.

- Continue reading the other pages directing children's attention to the animal and its special adaptation feature.

BUILD WORD POWER

- Read the story again, now focussing on words that appear frequently or are used several times in the story.
  High Frequency words
  The, This, It

- Then focus on the high interest words. High interest words enrich a child's vocabulary.
  High Interest words
  Purple, prey, warning, snout, glide, swim, dance, water, fly, jump, eat

- Print out the words or write them neatly using a large font to make flash cards.

- Use the following strategies to teach them these words:
  1. **See and spell**: Flash the word. Children see the word and say it, for example, 'jump'.
  2. **Spell reading**: Flash the word again and read out each letter. Children repeat after you.
  3. **Arm tapping**: Say the word and spell it while tapping your finger on the child's arm for each letter.

Follow up Activity:
End this part of the lesson by having students complete the worksheet 'Cloze the gap'.

AFTER READING: EXTENSION ACTIVITIES

STEM CONNECTION

SESSION FOCUS: BODY ADAPTATION TO SURVIVE

LEARNING OUTCOME:

Children will be able to explain the various adaptions.

- Ask children what kind of clothes they wear in winter?

- Explain that in order to keep our bodies warm, we wear woollen clothes. Similarly, some animals have more fur to keep them warm in winter.

- Ask them to think of animals that live in a cold climate. Good examples include the polar bear, foxes, bison and snow rabbits. Show them a picture of a polar bear. A polar bear is white so that it is not easily spotted in the ice, and its body is covered with thick fur to protect it.

- Now show students a picture of a penguin. Tell them that a penguin has a special layer of fat under its skin known as blubber which protects it from extreme cold climates.

ACTIVITY: BLUBBER AND HOW IT WORKS:

You need:

1. glass of chilled water
2. thin plastic
3. play dough

To do:

— Take a glass of chilled water.
— Wrap the thin plastic around his/her finger.
— Ask him or her to dip the finger in water. Ask if the finger feels cold?
— Next, cover his or her finger with the play dough and wrap the plastic around it. Have the student wrap the dipped finger in the chilled water.
— *Ask*: When did they feel the cold? (When their finger was covered with the play dough or without?)
— Explain that the play dough acted like blubber, protecting their finger from the cold.

STEM CONNECTION

SESSION FOCUS: ADAPTATION FOR EATING

LEARNING OUTCOME

Students learn how animal teeth have adapted to eat food.

- Recall from the previous story how bees have a proboscis in order to suck nectar from flowers. This is a special adaptation feature.

- Similarly, animals have different types of teeth to eat different types of food.

• Show students pictures of lion teeth and deer teeth. Ask them to identify the difference between the two. A lion is a carnivorous animal. It eats meat. It has sharp teeth to tear the meat, whereas a deer has blunt teeth to chew grass.

You need:
1. Tweezers (dove beak),
2. Pliers (for birds like sparrows,)
3. Skewer or a toothpick (for wood pecker, heron etc.)
4. Spoon (for duck beak)
5. Rubber bands (to represent worms)
6. Cheese (to represent Insects)
7. Ground nuts or any type of nuts
8. Rice grains
9. Beads, etc.

To do:
— Set up stations with the listed equipment and suggested items to represent food.
— Have students take turns to pick up different food items with the equipment placed at the station. After the activity, discuss how birds have different types of beaks depending upon the food they have to eat.
— This activity will not only help them gain an understanding about the animal adaptation but also develop their fine motor skills.

ARTS CONNECTION

SESSION FOCUS: THE CHAMELEON MIX UP

LEARNING OUTCOME

Students learn how a chameleon's colour can help it survive. This is a trait.

You need:
1. OHP sheets or transparent plastic sheets
2. A chameleon cut out for tracing
3. Art sheets for children to colour
4. Crayons

To do:
— Cut out an outline of a chameleon on the transparent plastic or OHP sheets.
— Ask children to colour their art sheet with different patterns. They can fill it up with dots, lines or make other designs like flowers, leaves, a tree trunk etc.
— Give each child the transparent chameleon cut out and ask them to place it on the background prepared to see how a chameleon changes colour according to the environment.

LANGUAGE ARTS CONNECTION

SESSION FOCUS: STORY READING

LEARNING OUTCOME

Students learn about different traits

Read the stories:
1. The Mixed up Chameleon by Eric Carle
2. Claws, Coats and Camouflage by Susan.E. Goodman

After reading each story, discuss the distinct physical feature of each animal. Bring out the importance of uniqueness and how important it is to be happy with what we have.

Video Hub

Watch these exciting videos.

A Chameleon https://www.youtube.com/watch?v=UftzbFan9hw

Animals with winter coats https://www.youtube.com/watch?v=0N7FGPeykfE

If you had animal teeth https://www.youtube.com/watch?v=MqHr51mHBDo

Desert adaptation https://www.youtube.com/watch?v=WViUUMClAUQ

Name _____ Date _____

READ IT, FIND IT, WRITE IT

Read the sight words 'the', 'is' and 'and'.

the

Find the word /the/ and circle it

the	eth	teh	the
will	can	is	the
be	the	can	go
do	if	and	the

is

Find the word /is/ and circle it

the	is	the	the
is	can	is	will
be	is	can	go
is	if	and	the

and

Find the word /and/ and circle it

and	is	the	the
is	can	is	and
and	is	can	go
is	if	and	the

Practise writing the word /**the**/

Practise writing the word /**and**/

Practise writing the word /**is**/

Name _____ Date _____

CLOZE THE GAP

Use the words in the word bank to close the gap in the sentence.

Glides	warning	sharp	jumps	swims	colour	prey

1. A flying squirrel _____ from a tree.
2. The 'Great Indian centipede _____ has colours.
3. The Indian bull frog _____ over water.
4. The Gharial has rows of _____ teeth in its long snout.
5. The Ganges river dolphin _____ in the Ganges river.
6. The fluorescent Purple frog's _____ warns its predators.
7. The shark catches its _____ with its snout.