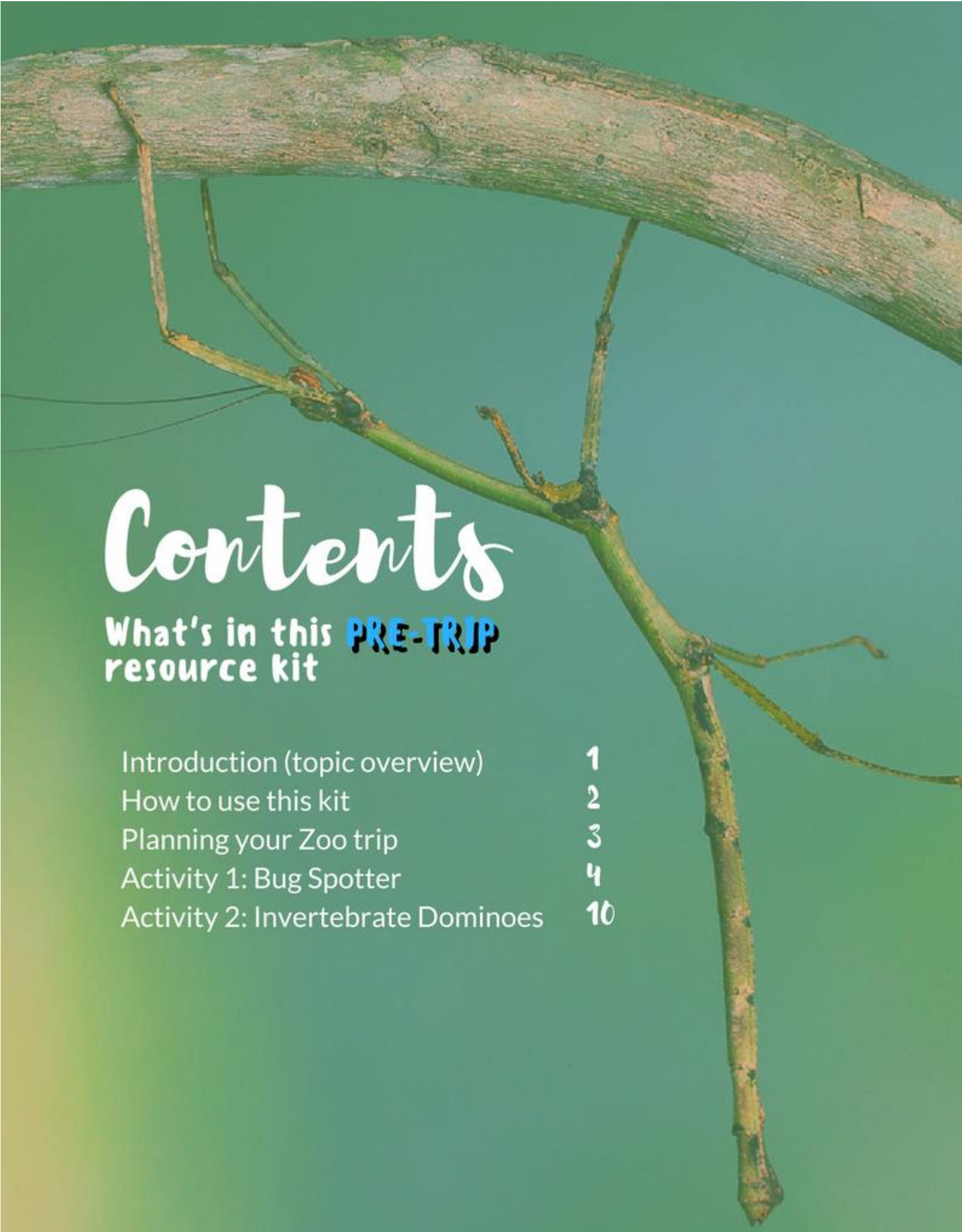
Bug Discovery Kit

PRE-TRIP

Wildlife Reserves SINGAPORE

Jurong Bird Park · Night Safari · River Safari · Singapore Zoo



Contents

What's in this PRE-TRIP resource kit

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Introduction

Topic Overview

What's this kit about?

This **Bug Discovery Kit** provides an introduction to the wonderful world of **insects and other invertebrates.**

The resources included in the kit may be used for independent learning on the topic of insects and invertebrates, or may also be used before, during, or after a field-trip to the Zoo. **This particular section contains activities to do before the field-trip!**

The activities may also be used to complement the following books on the P1 and P2 STELLAR reading list:

- P2 book: A Butterfly is Born
- P2 book: The Underground Dance
- P2 book: Life in a Shell
- P2 book: The Grasshopper and the Ant
- P2 book: Walking through the Jungle

How to use this kit

PRE-TRIP PACK

This entire Bug Discovery kit consists of **3 resource packages**, which are divided into:

1. **Pre-trip** *(you are currently viewing the Pre-trip package)*
2. **During-trip**
3. **Post-trip**

Within each resource package, you'll find an introduction with a topic overview, information about the kit, and tips on how to plan your own visit to the Zoo.

You'll also find activity outlines and instructions, followed by a glossary of relevant terms, and all printable resources needed for each specified activity.

While some activities are more suited to pre-trip, during trip, or post-trip purposes, feel free to switch their order depending on how you have planned your lesson!

Planning Your Zoo Trip

Getting to the Zoo

Morning traffic is always unpredictable, so to make the best of your fieldtrip and arrive as planned, we recommend that you leave school earlier. Check out the location and transportation information page on the zoo website for more details to help you plan your arrival. You can also download a soft copy of the park map for your reference on that page.

Admission

Find out more about school rates, ride pricing, and even book your tickets on our website's school groups portal.

Behaviour

Prepare your students on your chosen topic and what they should look out for at Singapore Zoo. You can let your students know more about proper behaviour at the zoo, such as no teasing or unsupervised feeding of the animals.

Education programmes

If you're planning to sign your students up for an education programme offered by our Education department, you may get more info about our different offerings here. For Primary school students, we suggest Behind-the-Scenes tours, Guided tours at exhibits, and enrichment programmes.

Planning a teachers' recce trip

If you're planning a self-guided learning journey around the park, it's best to first familiarize yourself and the rest of the teaching staff with the Zoo! Visit our Education pre-visit page here to download a recce form, or email us directly about a recce at eduadmin.zoo@wrs.com.sg.

Activity 1

BUG SPOTTER

About this activity

Relevant STELLAR book	**P2 – The Grasshopper and the Ant**
Relevant subject discipline	English language (vocabulary building)
Values in action	✓ Integrity – exercising personal responsibility and integrity while completing the word-search truthfully ✓ Responsible decision making – working together to make the best decisions for the team ✓ Social awareness – working as a team, overcoming conflicts and differences of opinion
Objective	To build English vocabulary in partnership with the STELLAR book, The Grasshopper and the Ant. To encourage students to work in groups and exercise social and decision-making skills.
Recommended group size	✓ Groups of 5 (6 groups in total) ✓ Activity is completed as a class
Materials included	• Bug Spotter word search sheet • Bingo sheet (design A, design B) • List of words hidden in the word search (at the end of this activity outline)
Additional materials (not included)	Whiteboard, markers

Opening the activity

- Read **P2 STELLAR book, "The Grasshopper and the Ant"** with the class
- Pick out and explain words or terms that might be new to them (for example: mood, zest, snug, winter, wiser, grasshopper, etc)
- Discuss the storyline and characters – ask students what they understood from the story
- Discuss how the story covers the themes of teamwork, responsibility, and sharing

Activity instructions

Preparation	1. Locate the "Bug Spotter" printable package (after this instruction sheet) 2. Print 1 word search sheet (A3 size) for each group of 5 students 3. Print 3 bingo sheets (A4 size or smaller) with design A 4. Print 3 bingo sheets (A4 size or smaller) with design B 5. Seat the 6 groups such that 3 are on one side of the classroom (team A), and the other 3 are on the opposite side of the classroom (team B) 6. Hand out 1 A3 word search sheet to each group 7. Team A's groups will get 1 bingo sheet of design A each, and likewise for Team B
Gameplay	1. Tell the class that they'll be playing Bingo, with one side of the classroom (3 groups) battling against the other (3 groups) 2. *If necessary, explain the rules of bingo – they must aim to cross out 5 numbers in a row* 3. However, each side must 'earn' the right to call out a number to cross out. They earn this right by being the first to spot specific words in the word-search sheet 4. The teacher/facilitator will have the full list of words hidden in the word search. During each round, write one of these words on the board, and ask the class to find this word 5. The Team that finds the word first wins the right to call out a number, and everyone must cross this number out on their bingo sheet 6. Teams must communicate within the groups, to decide which numbers they should call out in order to score 5-in-a-row 7. Continue steps 4 – 6 until a winning Team scores BINGO! 8. If you run out of words before any team scores a full BINGO, then the team closest to doing so will win! 9. Everyone in that team (3 groups of 6) will win a prize

Closing activity	• Get the students to share their experiences of the game
	  ○ When did they feel best? When did they feel worst? Why might they have felt that way?
	• Facilitate the sharing and discussion
	  ○ How did they feel if they didn't manage to spot the words first?
	  ○ What did they feel about bingo – how did they decide which numbers to call out?
	  ○ Were there any disagreements during the game? How did the people involved feel about the situation?
	• Round off the sharing by linking the game back to The Grasshopper and the Ant
	  ○ How did their experiences relate to the characters, story, and theme?

Further exploration

Leveling up!

Now that the class has honed their team-skills and gotten an introduction to some simple terms involving insects and invertebrates, they can work together in groups to figure out what those terms mean. Download and print the next pre-trip activity, **Invertebrate Dominoes**, and let the students learn more about invertebrates and their characteristics.

Visit the Zoo

Spot some *actual* bugs! To continue the lesson and build on the terms learnt earlier, you could take up a programme, **Enrichment Class: Bug Discoveries**, with our Education Department. This class includes workshop facilitation and encourages learning through station-based activities. More information can be found on our website, here.

Glossary

Arachnid	An arthropod animal with 8 legs, of the class *Arachnida*
Insect	A small arthropod animal with 6 legs, generally 1 or 2 pairs of wings
Invertebrate	An animal lacking a vertebral column, or backbone
Metamorphosis	In insects or amphibians, the process of transformation from an immature form to an adult form in two or more distinct stages
Seasons	Each of the four divisions (spring, summer, autumn, winter) marked by particular weather patterns and daylight hours, resulting from the earth's changing position with regard to the sun
Snug	Comfortable, warm, cosy. Protected from the weather or cold
Vertebrate	Animals that have a brain enclosed in a skull, and a segmented spinal column (backbone)
Zest	Great enthusiasm and energy

Printable package

1. **Word list**

Approximately 50% of the words will be from The Grasshopper and the Ant, and 50% will be new words related to insects and bugs.

From the book's text	grasshopper	ant	bee	narrator	butterfly
	summer	zest	mood	busy	winter
	spare	snug	share	wise	
From the book's pictures	banjo	scarf	guitar	wheelbarrow	
New words	insect	wings	feelers	exoskeleton	antenna
	seasons				

2. **Bug spotter word search list**

3. **Bingo sheets (Team A, Team B)**

Bug Spotter – WORD SEARCH

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

Wildlife Reserves SINGAPORE

Jurong Bird Park

Night Safari

River Safari

Singapore Zoo

BINGO – Team A

1) Welcome to **Bug Spotter Bingo!**
2) In order to win, you must cross out 1 straight line of numbers
3) Make sure you call out numbers that help you win!

13	5	23	7	1
9	20	17	2	22
25	3	24	11	12
6	4	15	10	19
8	21	18	14	16

BINGO – Team B

1) Welcome to **Bug Spotter Bingo!**
2) In order to win, you must cross out 1 straight line of numbers
3) Make sure you call out numbers that help you win!

17	8	15	3	7
10	14	11	22	6
12	20	2	25	24
13	23	19	9	4
1	18	16	21	5

Activity 2

Invertebrate Dominoes

About this activity

Relevant STELLAR book	**P2 – A Butterfly is Born**
Relevant subject discipline	English language, science
Values in action	✓ Self-management – self-guided learning and discovery ✓ Social awareness – overcoming conflicts and differences of opinion in a group ✓ Collaboration and communication skills – working together and communicating as a group towards a common goal
Objectives	Understand and reinforce through group activities what invertebrates are, as well as the key characteristics of insects. To understand key terms about insects and invertebrates that have been introduced (but not taught) earlier, possibly during **Bug Spotter.**
Recommended group size	✓ Groups of up to 5 ✓ Can be conducted within groups as a class
Materials included	• A deck of Insect Dominoes cards (16 cards on 2 printable sheets, 8 per sheet)
Additional materials (not included)	None

Opening the activity

- Read **P2 STELLAR book, "A Butterfly is Born"** as a class
- Pick out words that might be new to them
  - If doing this activity after **Bug Spotter,** pick out words that might have been included in **Bug Spotter** (butterfly), or which are entirely new to them (chrysalis, nectar, caterpillar, pupa, crumpled, life cycle)
- Ask the students to discuss what they think the words mean
- Get the students to share what they've learnt or think from reading the book
  - Do butterflies look the same throughout their life?
  - What does a 'baby butterfly' look like?
  - What are some differences between each stage of the butterfly's life?

Activity instructions

Preparation	1. Locate the "Invertebrate Dominoes" printable package 2. 1 printed package = 1 deck of Invertebrate Dominoes cards 3. Prepare 1 deck for every group of 5 students
Gameplay	1. Shuffle the deck thoroughly 2. Locate the 'Start' card and the 'Finish' card. Place the 'Start' card on the left of the playing area, and the 'Finish' card on the right 3. Tell the class that each card in the deck consists of 2 parts: a question portion on the right, and an answer portion on the left 4. The question and answer on any individual card will not match 5. The group must sort the entire deck, and arrange the cards into a chain of correctly answered questions from Start (left) to Finish (right) 6. An answer must match the question of a card before it, and etc 7. Go around the class, checking in on the group 8. The first group that correctly sorts their entire deck wins! **Remarks** • Each matching pair of Question and Answer portions (on separate cards) will have a similar illustration. For example, the Question portion might have the upper body of a ladybug, while the Answer portion might have the lower body of a ladybug • Even if they don't initially know the answers to the questions, this card design allows students to learn via self-correction, and discover the answers themselves
Closing activity	• Get students to share their experiences of the activity ○ What is your favourite new word from today's activity? Can you explain what it means?

Further exploration

DIY Domino Battle

Get each group of students to make their own deck of cards on a different or related topic. They would need to research their topic, come up with simple questions, and fabricate their own cards. The different groups can challenge each other to 'battle' (quiz) with their different home-made decks!

Butterfly Rock-Paper-Scissors

Get the entire class to play a game of rock-paper-scissors to revise what they've learnt, but a butterfly life-cycle edition! Everyone starts out as an egg and wanders around doing the corresponding action. If they meet another egg, they're to play rock-paper-scissors – the winner 'grows up' into a caterpillar! The loser has to find another egg to play against.

Turn to the next page for a visualisation of this game!

Egg

- Squatting on the ground
- Move while squatting
- Moves slowly

Caterpillar

- Standing, but making "chomping" motions with arms
- Moves around while chomping

Chrysalis

- Hands above head, "ballerina" style
- Moves with arms raised, slowly

Butterfly

- Arms outstretched at side, arms flapping
- Moves around quickly

Glossary

Antenna	A pair of long, thin, sensory appendages on the heads of insects, crustaceans, and other arthropods
Arachnid	An arthropod animal with 8 legs, of the class *Arachnida*
Chrysalis	Usually refers to the pupa of butterflies
Insect	A small arthropod animal with 6 legs, generally 1 or 2 pairs of wings
Invertebrate	An animal lacking a vertebral column, or backbone
Larva	The active, immature form of an insect. Usually one that differs greatly from the adult and forms the stage between egg and pupa
Life cycle	The series of changes in the life of an organism, including reproduction
Metamorphosis	In insects or amphibians, the process of transformation from an immature form to an adult form in two or more distinct stages
Nectar	A sugary fluid secreted within flowers to encourage pollination by insects and other animals
Pupa	An insect in its inactive immature form, between larva and adult
Vertebrate	Animals that have a brain enclosed in a skull, and a segmented spinal column (backbone)

Printable package

#	Answer-half (left)	Question-half (right)
1	*Not applicable (Starting card)*	**START**: How many legs do insects have?
2	Six (6)	How many body parts do insects have?
3	3	Do all animals have a backbone?
4	Nope, not all do	What are insect feelers also called?
5	Antenna	What are animals without backbones called?
6	Invertebrates	What is a life cycle?
7	The different stages that a living thing goes through while it grows up	How many legs do arachnids have?
8	8	How many body parts do arachnids have?
9	2	What does a butterfly begin its life as?
10	An egg	What is the larva of a butterfly also called?
11	A caterpillar	What does the caterpillar grow into?
12	A pupa (or chrysalis)	How do insects reproduce?
13	They lay eggs	What are social insects?
14	They live and work together in groups called colonies	What emerges from the chrysalis?
15	A butterfly	What is this butterfly life cycle also known as?
16	Metamorphosis	*Not applicable (Finishing card)*

Invertebrate Dominoes

Start

Question

How many legs do insects have?

Answer

6

Question

How many body parts do insects have?

Answer

3

Question

Do all animals have a backbone?

Answer

Nope, not all do

Question

What are insect feelers also called?

Answer

Antenna

Question

What are animals without backbones called?

Answer

Invertebrates

Question

What is a life cycle?

Answer

The different stages that a living thing goes through while it grows up

Question

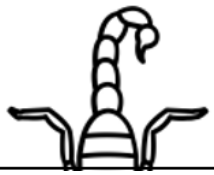
How many legs do arachnids have?

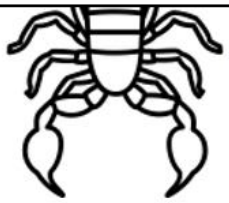
Answer

8

Question

How many body parts do arachnids have?





Answer

2

Question

What does a butterfly begin its life as?

Answer

An egg

Question

What is the larva of a butterfly also called?

Answer

A caterpillar

Question

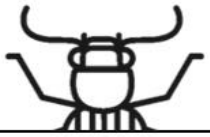
What does the caterpillar grow into?

Answer

A pupa (or chrysalis)

Question

How do insects reproduce?



Answer

They lay eggs

Question

What are social insects?

Answer

They live and work together in groups called colonies

Question

What emerges from the chrysalis?

Answer

A butterfly

Question

What is this butterfly life cycle also known as?

Answer

Metamorphosis

Finish