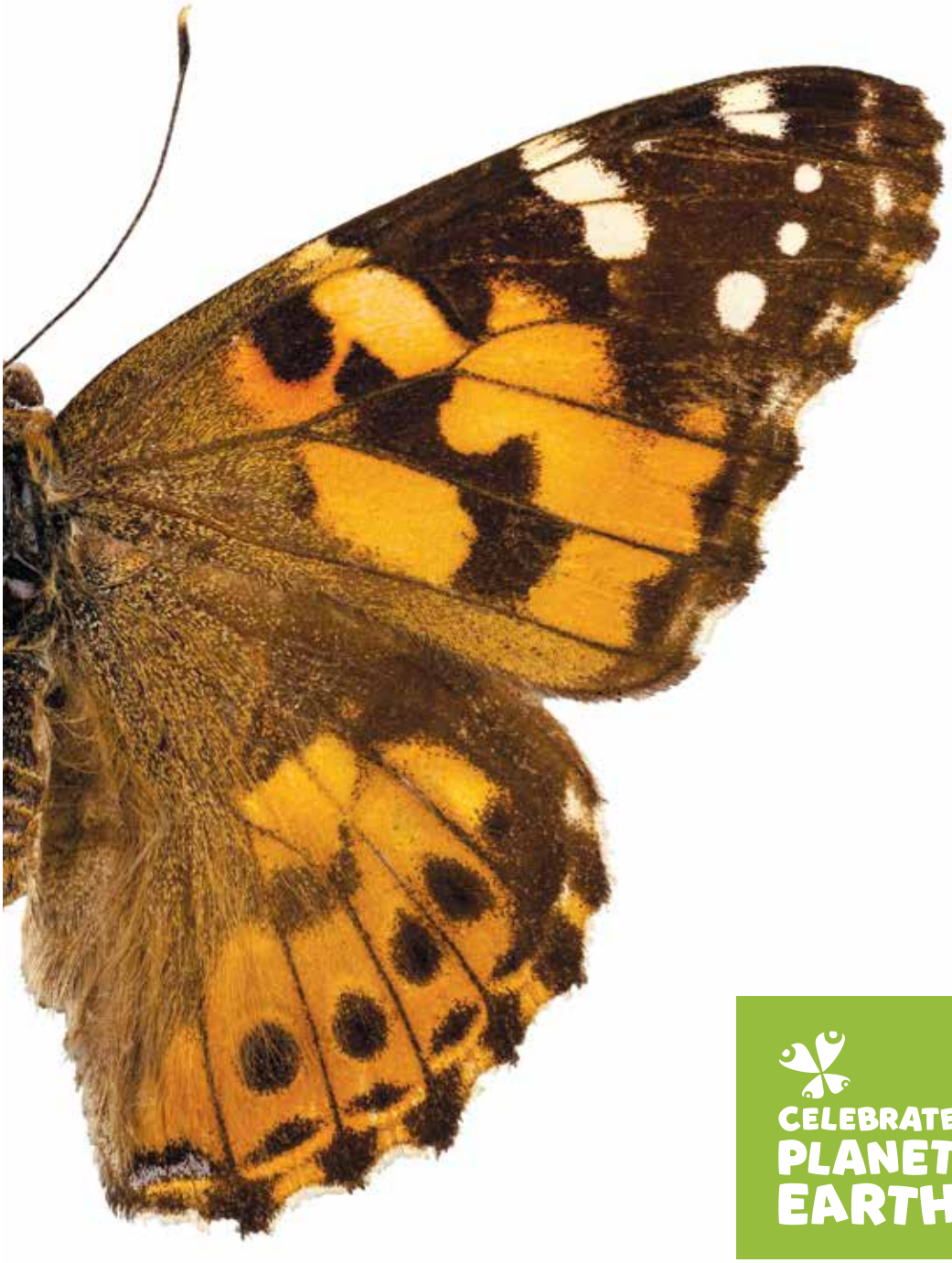
AMAZING BODIES, AMAZING BUTTERFLIES

Teacher's Guide
1st Grade Science Unit



BUTTERFLY LAB

CELEBRATE PLANET EARTH

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BUTTERFLY LAB

Acknowledgements

Butterfly Lab as developed through support from PNM, Los Alamos National Bank and Los Alamos National Laboratory Foundation and Carolina Biological. Celebrate Planet Earth is grateful for the insights and advice of Judy Chaddick, science teacher emeritus of the Espanola Valley Schools, who helped make these science units easy, educational and fun.

Celebrate Planet Earth grows children
who love & protect the Earth.

Since 1989, more than 15 million children have delighted in raising butterflies, growing sunflowers, learning about the natural world & supporting conservation. Our work empowers students to initiate environmentally responsible actions in school & at home.

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BUTTERFLY LAB

Contents

BUTTERFLY LAB

Overview

Teacher's Guide

This hands-on lab for 1st grade science builds experiences and skills for observing caterpillars closely and learning the anatomy of caterpillars, butterflies and other insects.

The lab includes Pre and Post Assessments with 8 activities for learning and integration. Based on your students' skills, use the Butterfly Lab in the ways that you think are best. Please see the Calendar below as a suggested sequence.

Su	M	T	W	Th	F	Sa
			Day 1 Pre Assessment	Day 2 What We Know About Butterfly Anatomy	Day 3 Butterfly Songs *Live caterpillars probably arrive.*	Day 4
Day 5	Day 6 Butterfly Word Wall	Day 7	Day 8 Caterpillar Body Parts	Day 9	Day 10 Comparing Insect Body Parts	Day 11
Day 12	Day 13	Day 14 Butterfly Body Parts	Day 15	Day 16 Build a Butterfly Model	Day 17	Day 18
Day 19	Day 20 What Does Each Body Part Do?	Day 21	Day 22 Post Assessment	Day 23 Climate Change & Butterflies	Day 24 Celebrate the Earth!	

BUTTERFLY LAB

Overview

The lab is a whole unit, but please select the activities that are best for your classroom. Or adapt an activity in a way that works for your students. Whatever activities you choose, delight in the wonder of nature with your students!

Before the Caterpillars Arrive
If your students have not experienced the wonder of caterpillars changing into butterflies, you may want to wait on some of these activities to keep it a surprise.

Do the *Pre Assessment* with your students. Discuss what it means to be a good friend to the Earth and all her creatures. Make copies of all the handouts in advance.

Have your students share what they know about butterflies with *What We Know About Butterfly Anatomy*. Have some fun learning songs about butterfly body parts.

The Caterpillars Are Here
The live caterpillars will arrive on a Thursday or Friday. They come with care instructions, a butterfly house & life cycle poster.

Begin building your science vocabulary using the *Word Wall*. When the caterpillars have grown a little bit, compare the *Caterpillar Body Parts Handout* with the living catepillars. Learn more about all insects with the *Comparing Insect Anatomy* activity.

When they all become chrysalises, transfer them into the butterfly house.

Butterflies Emerge
When the butterflies emerge from the chrysalises, the students can observe them for a few days. Learn even more about *Butterfly Body Parts* and the *Build a Buttefly Model* activity. Sing the songs to have fun and get the wiggles out as often as you like.

Observing the butterflies, your class can also study *What Does Each Body Part Do?* Remember to do a *Post Assessment* with your students. Have a discussion with your students with the *Climate Change & Butterflies* guidelines from our partners, Climate Science Alliance.

To sustain the butterflies while you are observing them, feed them with a sugar water wick or with cut fruit like oranges and melons. More information is in the *Care Instructions*.

If a butterfly emerges incompletely or is deformed, there is—sadly—nothing you can do to help. Explain to the children that this happens sometimes. Place it in a bush to be eaten by another animal. Remember: caterpillars and butterflies are important parts of your local food web.

Release and Celebrate
Plan a day of celebration when you release the butterflies! You can sing songs to thank the butterflies for all that you have learned about them.

- Outside temperature should reach at least 55°F during the day.
- Open your butterfly house and allow a butterfly to crawl onto a hand.
- The butterfly will borrow heat from your body to warm itself up to 68°F, so that it can fly away. Be gentle and patient.

Discuss with the children what it means to care for the Earth and all her creatures.

Standards Rubric: 1st Grade

1ST GRADE	Common Core: English Language Arts Standards	Reading: Informational Text
Key Ideas and Details:		
CCSS.ELA-Literacy.RI.1.1	Ask and answer questions about key details in a text.	
CCSS.ELA-Literacy.RI.1.2	Identify the main topic and retell key details of a text.	
CCSS.ELA-Literacy.RI.1.3	Describe the connection between two events, or pieces of information in a text.	
Craft and Structure:		
CCSS.ELA-Literacy.RI.1.4	Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.	
CCSS.ELA-Literacy.RI.1.6	Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.	
Integration of Knowledge and Ideas:		
CCSS.ELA-Literacy.RI.1.7	Use the illustrations and details in a text to describe its key ideas.	
CCSS.ELA-Literacy.RI.1.9	Identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).	
Range of Reading and Level of Text Complexity:		
CCSS.ELA-Literacy.RI.1.10	With prompting and support, read informational texts appropriately complex for grade 1.	
Next Generation Science Standards		
1-LS1	From Molecules to Organisms: Structures and Processes	
	Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, and meet their needs.	
LS1.A	All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air.	

Caring for Caterpillars, Caring for the Earth

Young children understand what it means to be a good friend. Talk with them about being a good friend. Write their suggestions on the board. How do you treat good friends? Can caterpillars and other animals be our friends? Is the Earth that gives us so much - air, water, food, beauty - our friend? How might they like to be treated? What can we do to help them?

Caring for living things in the classroom is a wonderful opportunity to learn:

- **all living things have needs**
- **what are the needs of other living things**
- **how to help with the needs of others**

1 - All living things have needs.
Every child understands their own need for food, shelter and care. And every living thing also has needs. We are all connected.

2 - What are the needs of other living things.
Caring for living things teaches your students that we all have unique needs. Not everyone's needs are the same. What is good for a child might not be good for a plant. The care of a seedling is different than the care of an insect.

3 - How to help with the needs of others.
Students want to interact and be involved with the living things around them. Checking to see if plants need water or if the caterpillars are becoming chrysalises builds a child's confidence and understanding. They learn about responding to what is needed and offering to help.

Teaching Students How to Care for Caterpillars
Observing caterpillars in your classroom is a great way to teach children about the pollinators that we depend on for food. Day by day, they observe how the caterpillars grow and change. They can see them eating their food. This is practical experience in understanding the needs of others and learning how to help.

BUTTERFLY LAB

Pre/Post Assessment

Overview

The activities begin with an individual assessment to effectively establish a baseline of students' understanding, help you decide what to emphasize and what needs to be adapted for your classroom. A pre-assessment provides a way to evaluate the children's growth at the end of the unit.

Materials

- Assessment Record (each sheet holds 15 names)
- handout for each student
- pencils/markers

Adapt the assessment, based on your students skill level.

1 Pass out the handouts and have them put their name and date on it.

2 Using a laptop or color print-out with a small group, or projected on the white board for the entire class, show the handout and focus the students' attention on the parts of a caterpillar.

- Tell the students that they will be identifying the parts of a caterpillar by drawing a line from each word to the correct part on the illustration.
- Use the first word that you point out as a demonstration - LEGS.
- Point to the word LEGS and say it out loud. Ask the students to look at the caterpillar and identify the LEGS. Point out the LEGS under the abdomen and then draw a line from the word to that body part.
- Next point out and say the word ABDOMEN. Ask the students to identify the ABDOMEN on their handout and draw a line to that part.
- Repeat with the words - HEAD and MOUTH.

3 On the handout, focus attention on the parts of a butterfly.

- Point to ANTENNA and say it out loud. Ask the students to find the ANTENNA and then draw a line from the word to that part.
- Repeat with the words - COMPOUND EYE, PROBOSCIS, THORAX, WING, LEG, ABDOMEN.

BUTTERFLY LAB

Assessment Record

	Observing the Features of Living Things		**Observing the Features of Living Things**	
	Ability to identify the parts of a caterpillar		Ability to identify the parts of a butterfly	
Student Name	**Pre**	**Post**	**Pre**	**Post**

BUTTERFLY LAB

Assessment

Name _____

Date _____

Body Parts of a Caterpillar

LEGS

HEAD

ABDOMEN

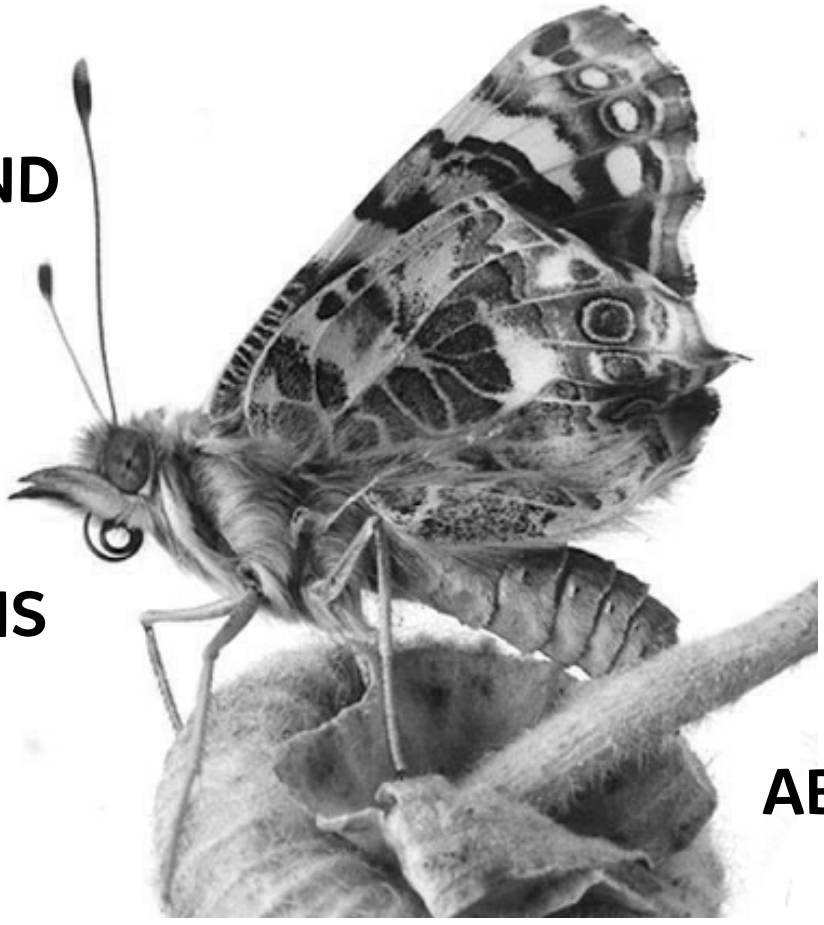
MOUTH

Body Parts of a Butterfly

ANTENNA

WINGS

COMPOUND EYE



LEGS

PROBOSCIS

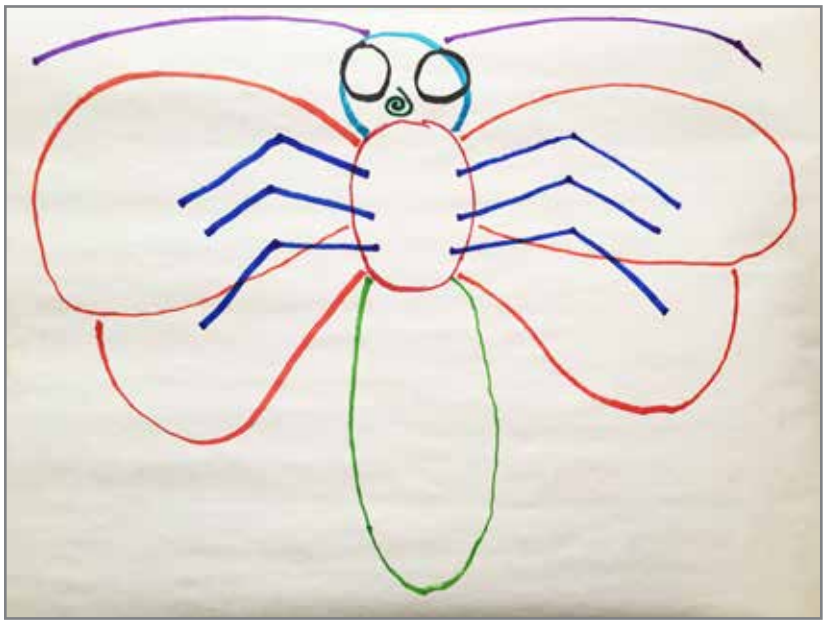
THORAX

ABDOMEN

BUTTERFLY LAB
What We Know about Butterfly Bodies

Overview
Children discuss *What We Know about Butterfly Bodies*. The teacher records information for display, including space to record *What We've Learned* during the unit.

What We Know
Diagram of the 8 body parts on the right



Time
30 minutes

Materials
newsprint, markers, post-it notes, bulletin board, blank sheets of paper

Step One
Explain to students that you'll be observing caterpillars and butterflies in your classroom and learning all about them. Tell them that this activity is an opportunity to share what they already know about the body parts of butterflies.

Ask the class to tell you - one at a time - a body part of the butterfly. On the whiteboard, draw the body part and write the label on a post-it note with the student's name. Be creative and use a variety of colors, different colors for different parts, to help the students see each one clearly. On blank sheets of paper, have the students draw each part and if they can, label each part.

The finished diagram should include these 8 body parts - head, thorax, abdomen, 2 antennae, 2 compound eyes, proboscis, 4 wings and 6 legs.

Prompt or instruct the students about any of the 8 body parts that they do not know.

Step Two
Talk about the body parts. What do they do? How do they help the butterfly survive?

Your students may know many things about butterflies like - *I see butterflies visiting flowers, butterflies can fly high, I saw a butterfly last summer.* Write these down on post-it notes and line them up beside the diagram of the butterfly body parts.

Following the discussion, transfer the drawing and post-it note labels onto newsprint or a bulletin board.

Step Three
Explain that as the class makes observations and learns new facts, write these on post-it notes and add to the diagram as *What We Learned*.

BUTTERFLY LAB

Head and Thorax, Abdomen, Abdomen

Sing to the tune of
“Head and Shoulders, Knees and Toes”

This song is a quick way to get your students moving and having fun. Be sure to touch your head, touch your chest and your belly while you sing. Make up your own movements for 6 legs, 4 wings and 2 antennae. Once your class knows the words and gestures, don’t forget to speed up!

Head and thorax
Abdomen, Abdomen

Head and thorax
Abdomen, Abdomen

Six legs, four wings
and two antenna

Head and thorax
Abdomen, Abdomen

Butterflies, Yes, I Like Butterflies

Call and response to the tune of "Alouette," also known as "Ravioli"

Butterflies, yes.
I like butterflies.
Butterflies, yes.
They're the bugs for me.

Do I see one butterfly?
Yes, I see one butterfly.
One butterfly.
One butterfly.

Ohhhhhhhh!
Butterflies, yes.
I like butterfli-ies.
Butterflies, yes.
They're the bugs for me.

Do I see two antennae?
Yes, I see two antennae.
Two antenna. *Two antenna.*
One butterfly. *One butterfly.*

Ohhhhhhhh!
CHORUS

Do I see three body parts?
Yes, I see three body parts.
Three body parts. *Three body parts.*
Two antenna. *Two antenna.*
One butterfly. *One butterfly.*

Ohhhhhhhh!
CHORUS

Do I see four pretty wings?
Yes, I see four pretty wings.
Four pretty wings.
Four pretty wings.
Three body parts. *Three body parts.*
Two antenna. *Two antennae.*
One butterfly. *One butterfly.*

Ohhhhhhhh!
CHORUS

Do I see five caterpillars?
Yes, I see five caterpillars.
Five caterpillars. *Five caterpillars.*
Four pretty wings.
Four pretty wings.
Three body parts. *Three body parts.*
Two antenna. *Two antenna.*
One butterfly. *One butterfly.*

Ohhhhhhhh!
CHORUS

Do I see six skinny legs?
Yes, I see six skinny legs.
Six skinny legs. *Six skinny legs.*
Five caterpillars. *Five caterpillars.*
Four pretty wings.
Four pretty wings.
Three body parts. *Three body parts.*
Two antenna. *Two antenna.*
One butterfly. *One butterfly.*

Ohhhhhhhh!
CHORUS

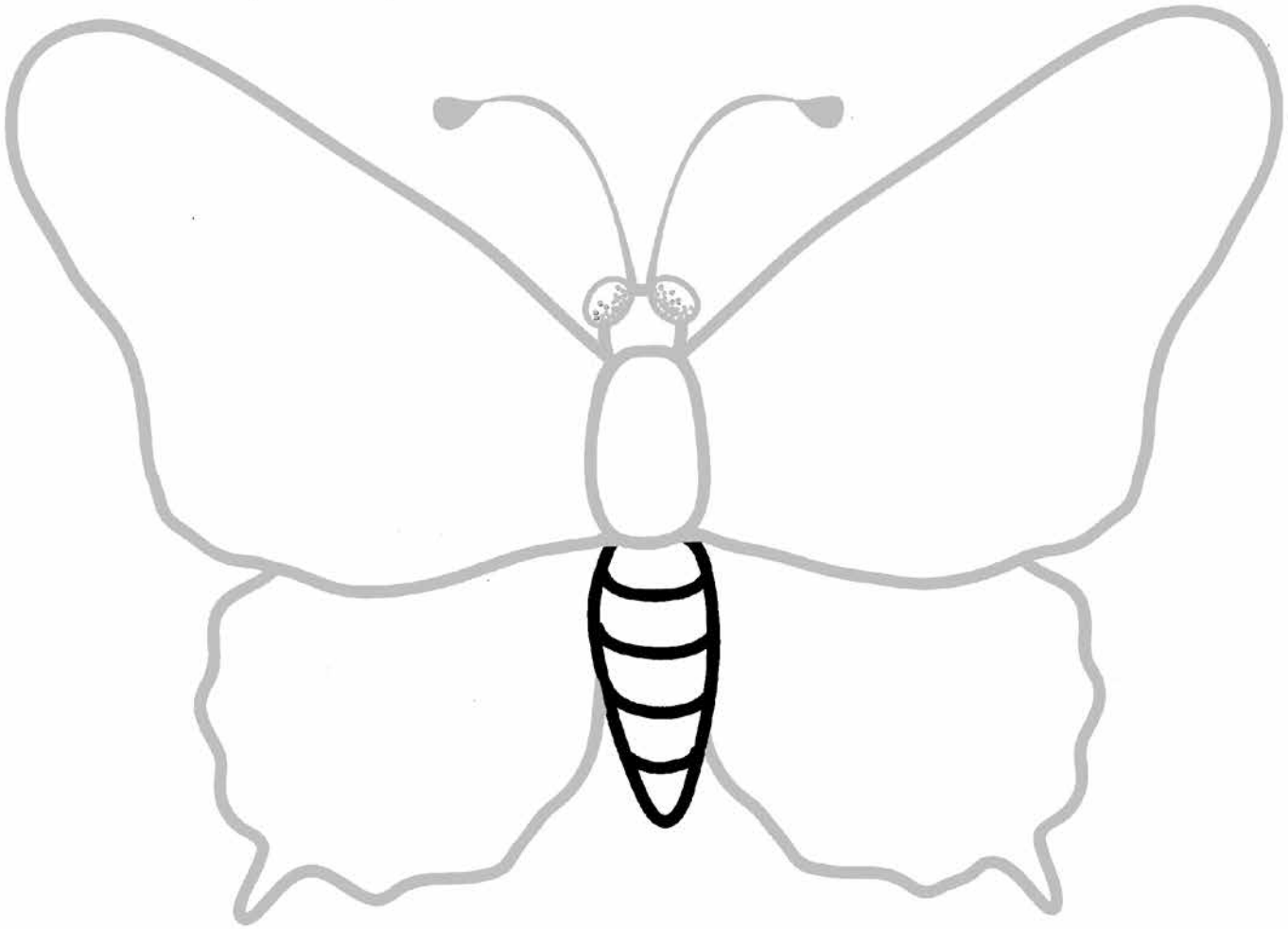
Word Wall: Butterfly Anatomy

The Word Wall is a set of words that are all related to caterpillars, butterflies and their body parts.

Here are ideas for using the Word Wall:

- **Tracing** - have your students trace the letters of each word with a finger. The students can say the letter out loud or silently. Pronounce the whole word at the end.
- **Act It Out** - as you go through the words, act out the meaning with your hands or your whole body. Especially good for kinesthetic learners.
- **Relate to Caterpillars & Butterflies** - as your caterpillars grow and transform, encourage the children to use these vocabulary words to describe what they see.

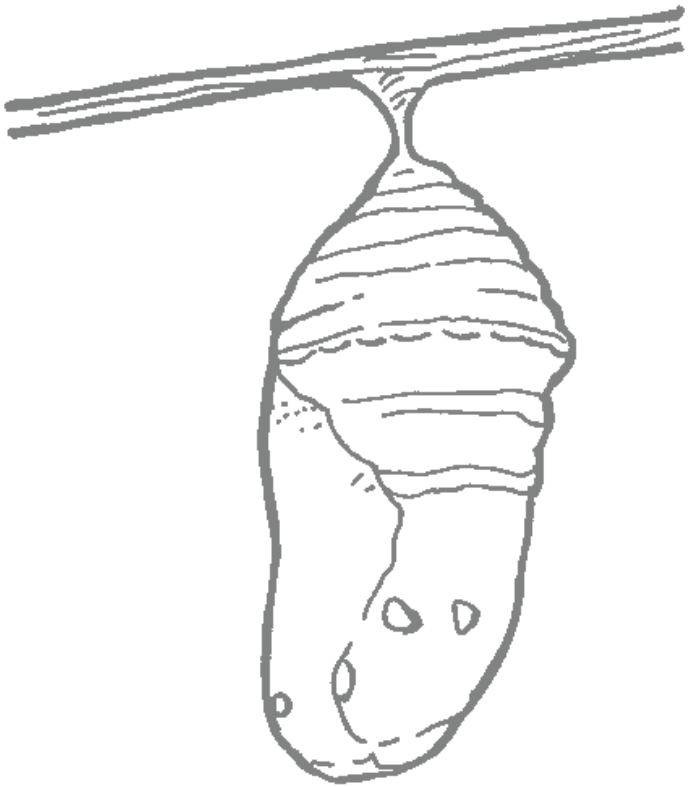
abdomen



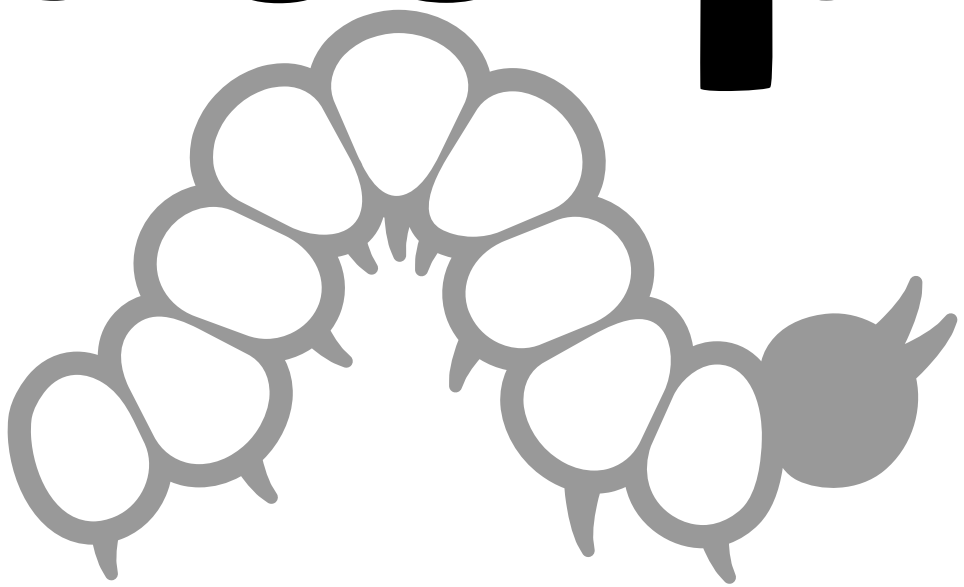
antena

butterfly

chrysalis



crawling caterpillar

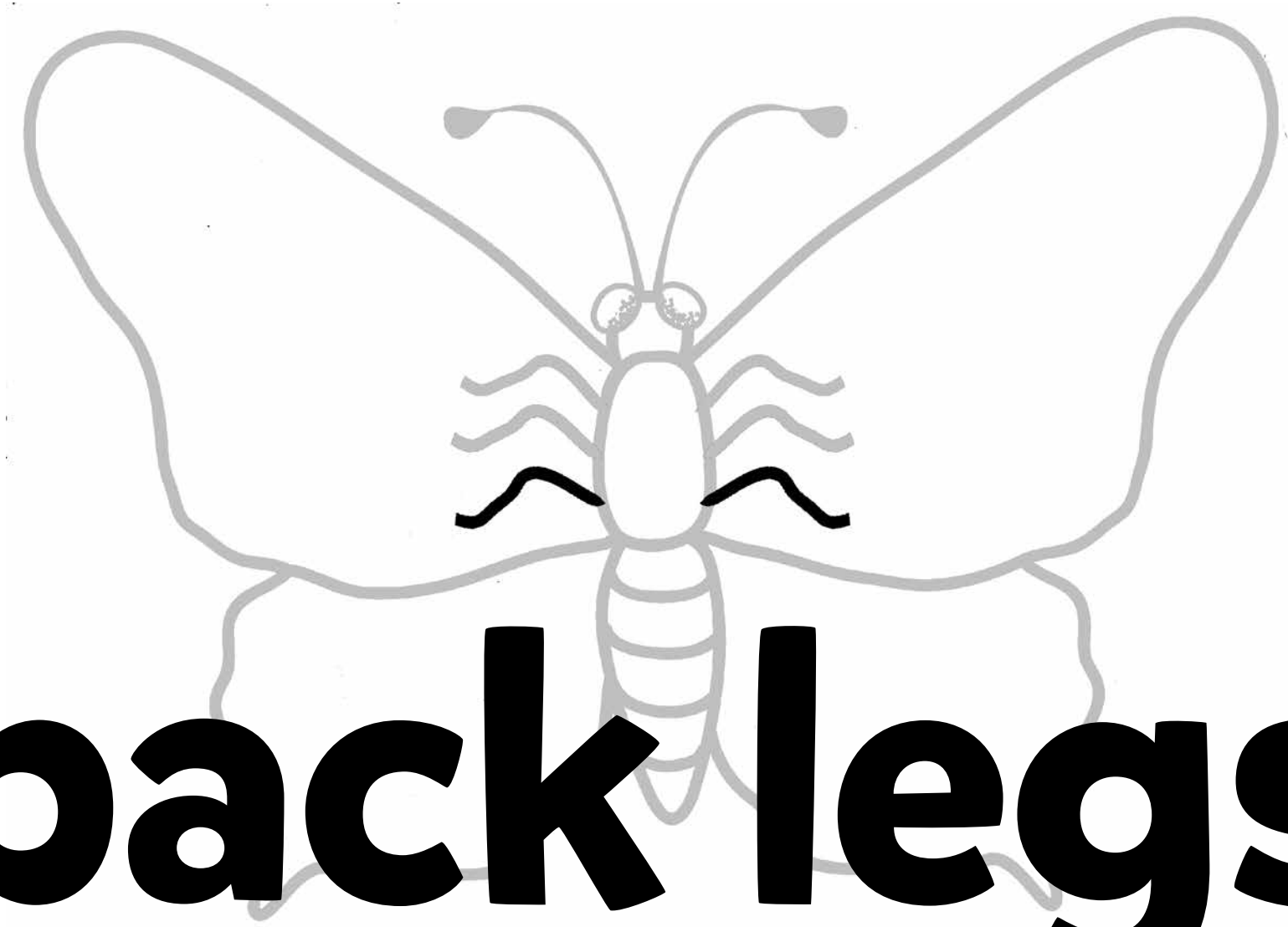


compound eyes

head

frontlegs

midges



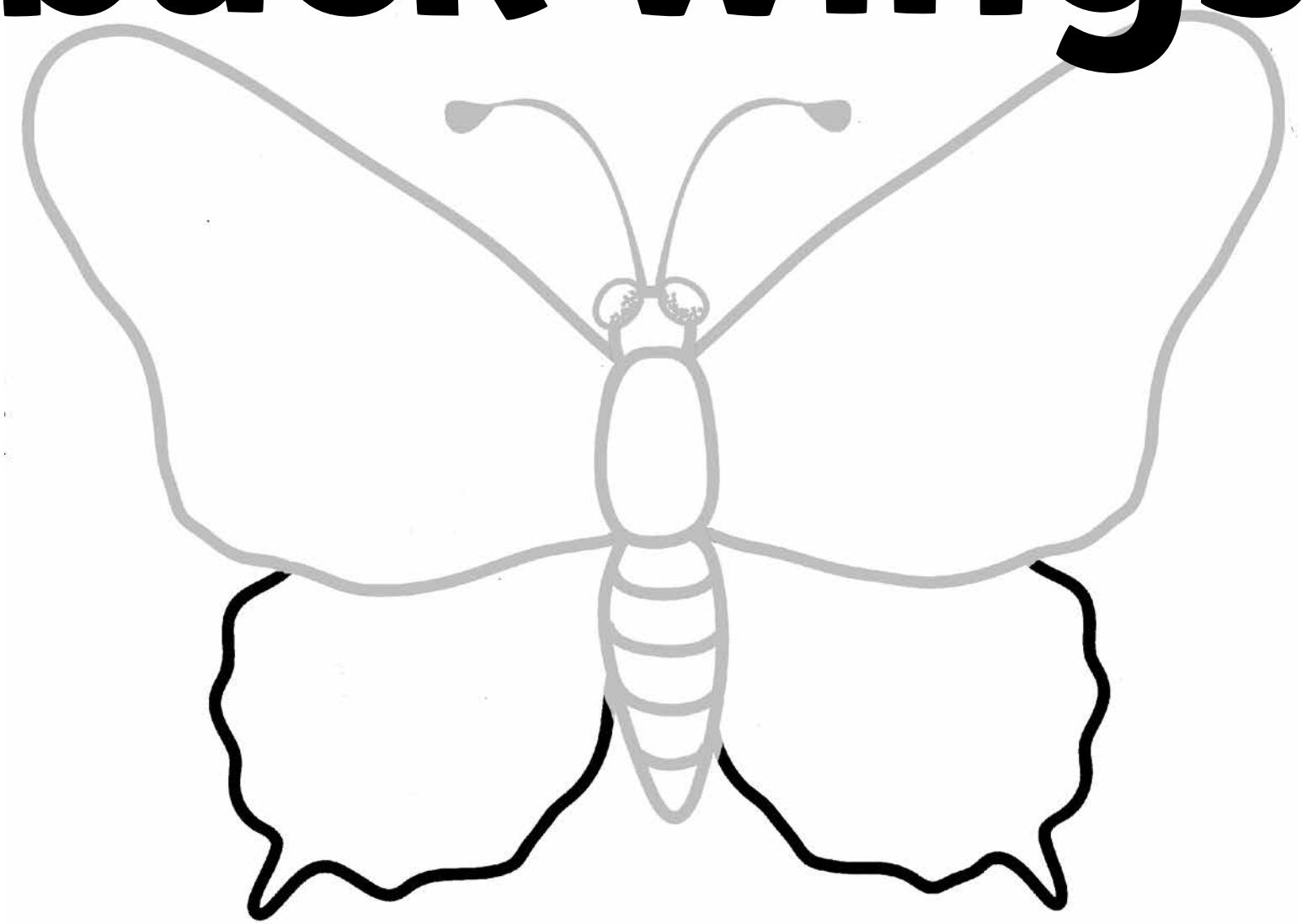
back legs

proboscis

thorax

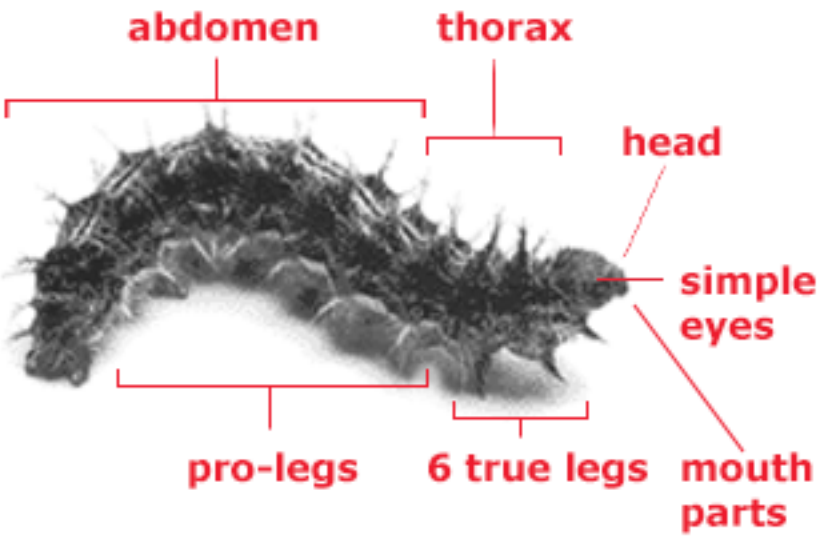
front wing

back wings



BUTTERFLY LAB

Caterpillar Body Parts



caterpillar or larva

Larva–the second stage of metamorphosis, another term for caterpillar

Head–the head includes a brain, a mouth, 2 antenna and 12 eyes called ocelli

Thorax–the thorax is the midsection where the legs are attached

Abdomen–the abdomen contains the heart, digestive system and other organs

True Legs–all insects have 6 true legs with tiny claws attached to the thorax

Pro-legs–located on the abdomen, pro-legs help the caterpillar move and climb

Mouth parts–on front of the head, a caterpillar has mouth parts to tear leaves and grind for food

Simple eyes–a caterpillar has 12 simple eyes, 6 on each side of its head, that show light and dark

BUTTERFLY LAB

Is It an Insect or Not an Insect?

Objective
As the students begin to understand the basic parts of a butterfly's body, it is useful for them to also understand that specific body parts help identify what is an insect.

Step One
Project the following 2 images on the whiteboard for the class or print them out. Both images have an image of a butterfly and another insect. Point to the illustration of the butterfly and ask the students to identify it. Then ask them to count specific body parts on the butterfly and write the numbers on the board.

Common insect body parts:

- 4 wings
- 6 legs
- 2 antenna
- 1 head
- 1 thorax
- 1 abdomen

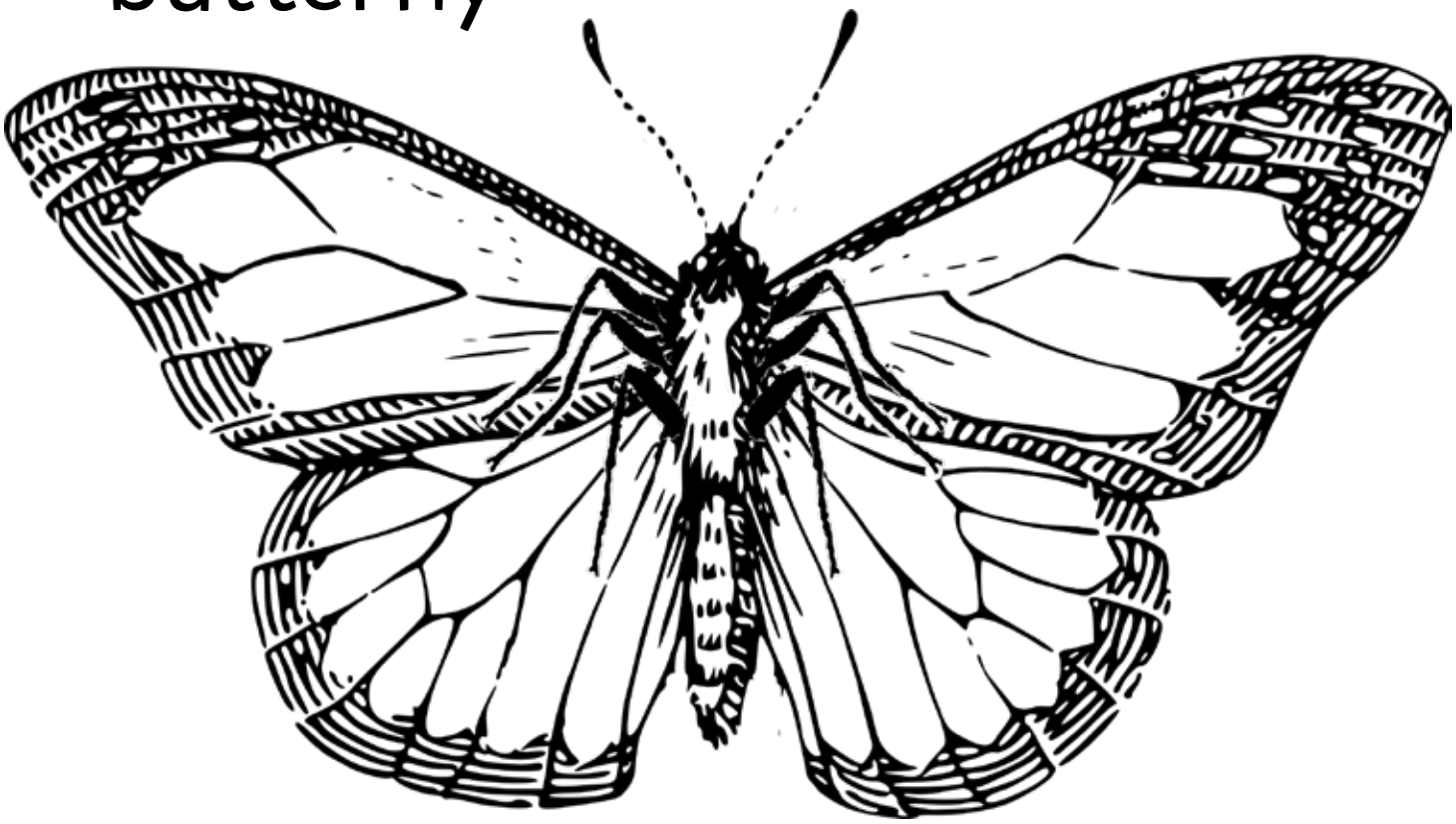
Then point to the honeybee and ask the students to count the same body parts. Write the numbers on the board. Ask the students to compare the numbers of each body part. All the numbers are the same.

Step Two
Do the same thing with the second image of 2 insects. Point out and have the students count each body part on the butterfly and on the grasshopper. Write the answers on the board and compare the numbers for the 2 butterflies, the honeybee and the grasshopper. Although these animals look different, they share the same number of important body parts and are in the same category known as insects. Point out that in a side view of an insect, all 4 wings and 6 legs may not be visible.

Explain that the majority of insects have wings, but a few do not. For example, **ants** are definitely insects, but they only have wings at a young stage of growth. Also, **beetles** are insects and it looks like they do not have wings. However, their wings are folded underneath a hard shell that covers the back.

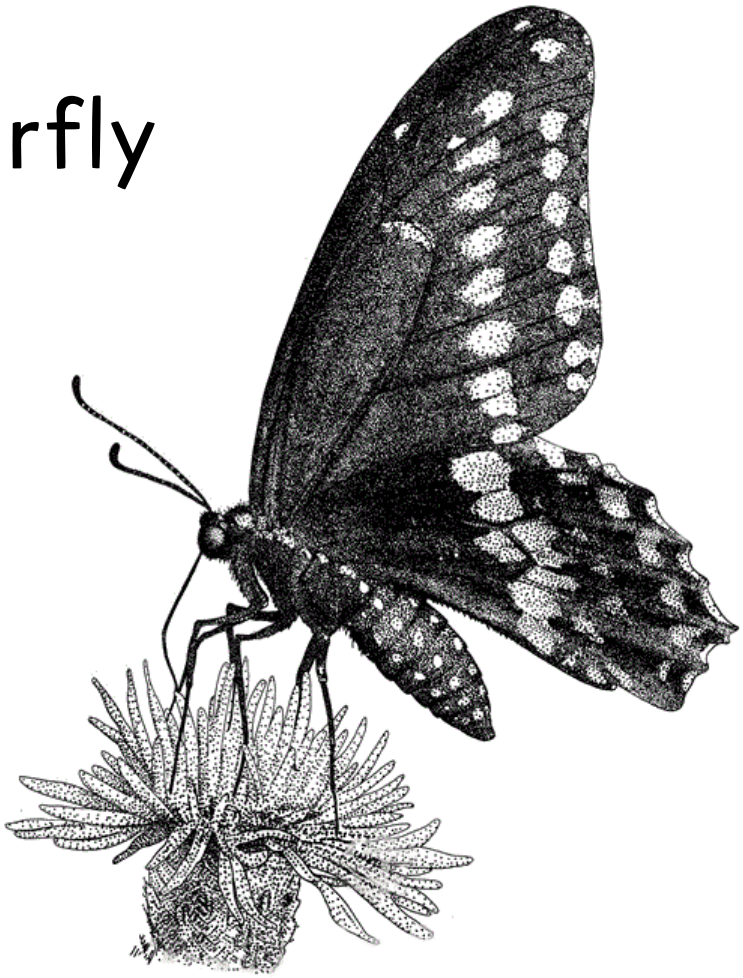
Step Three
Print out the worksheet for each student. Tell the students that they will be reviewing the body parts of insects. They will circle the pictures of insects and cross out the pictures that are not insects on the worksheet. The students will need to count the body parts of each picture, just like you did together as a class.

butterfly

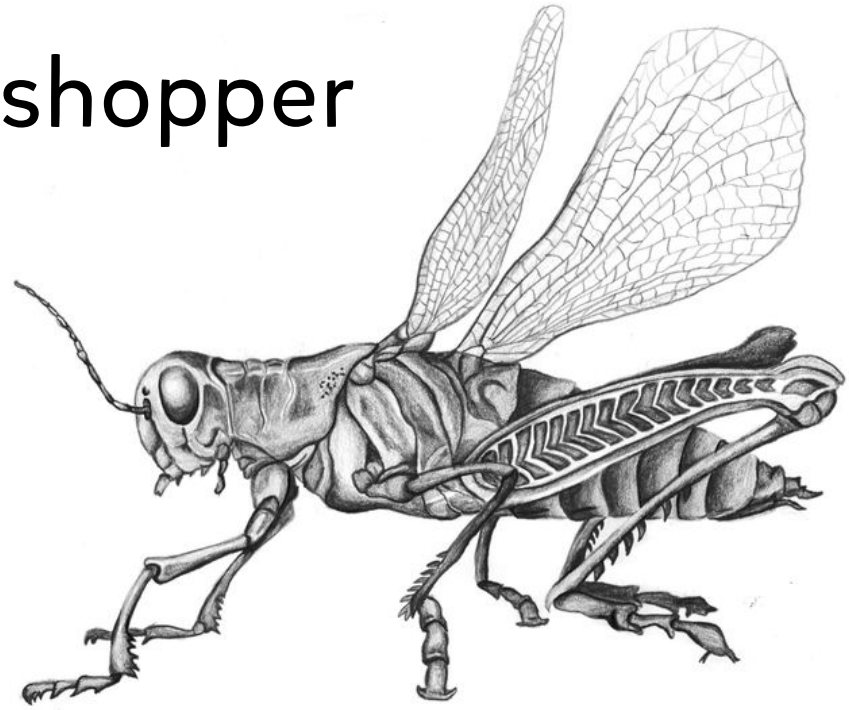


honeybee

butterfly



grasshopper



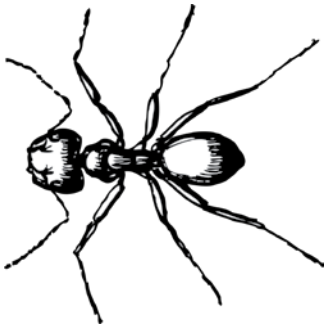
BUTTERFLY LAB

Is It an Insect or Not an Insect?

Name _____

Date _____

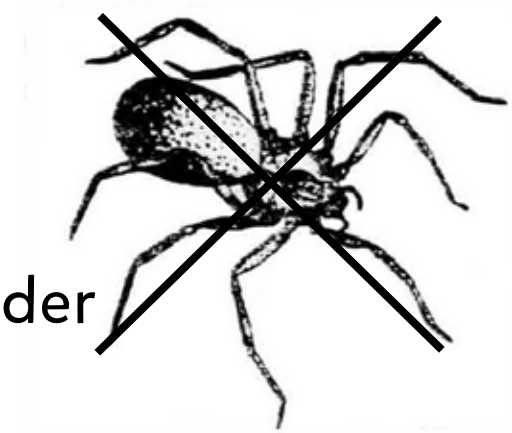
Circle the the things that are insects.
Mark an X through the things that are not insects.



BUTTERFLY LAB

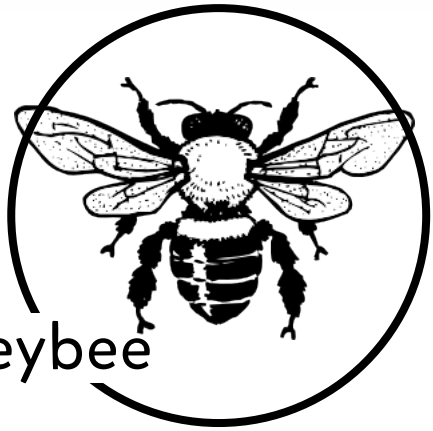
KEY: Is It an Insect or Not an Insect?

Circle the the things that are insects.
Mark an X through the things that are not insects.

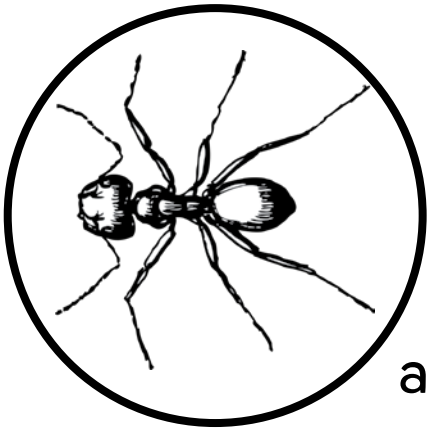


spider

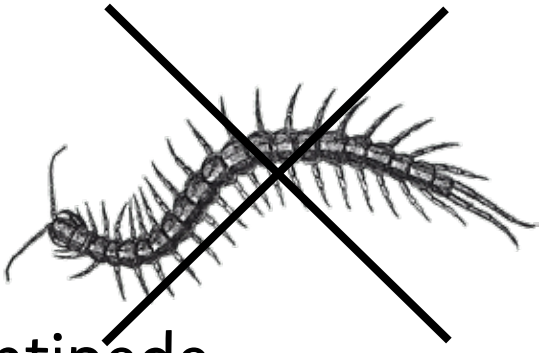
dragonfly



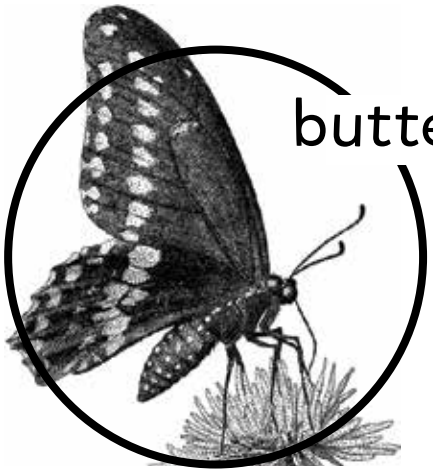
honeybee



ant



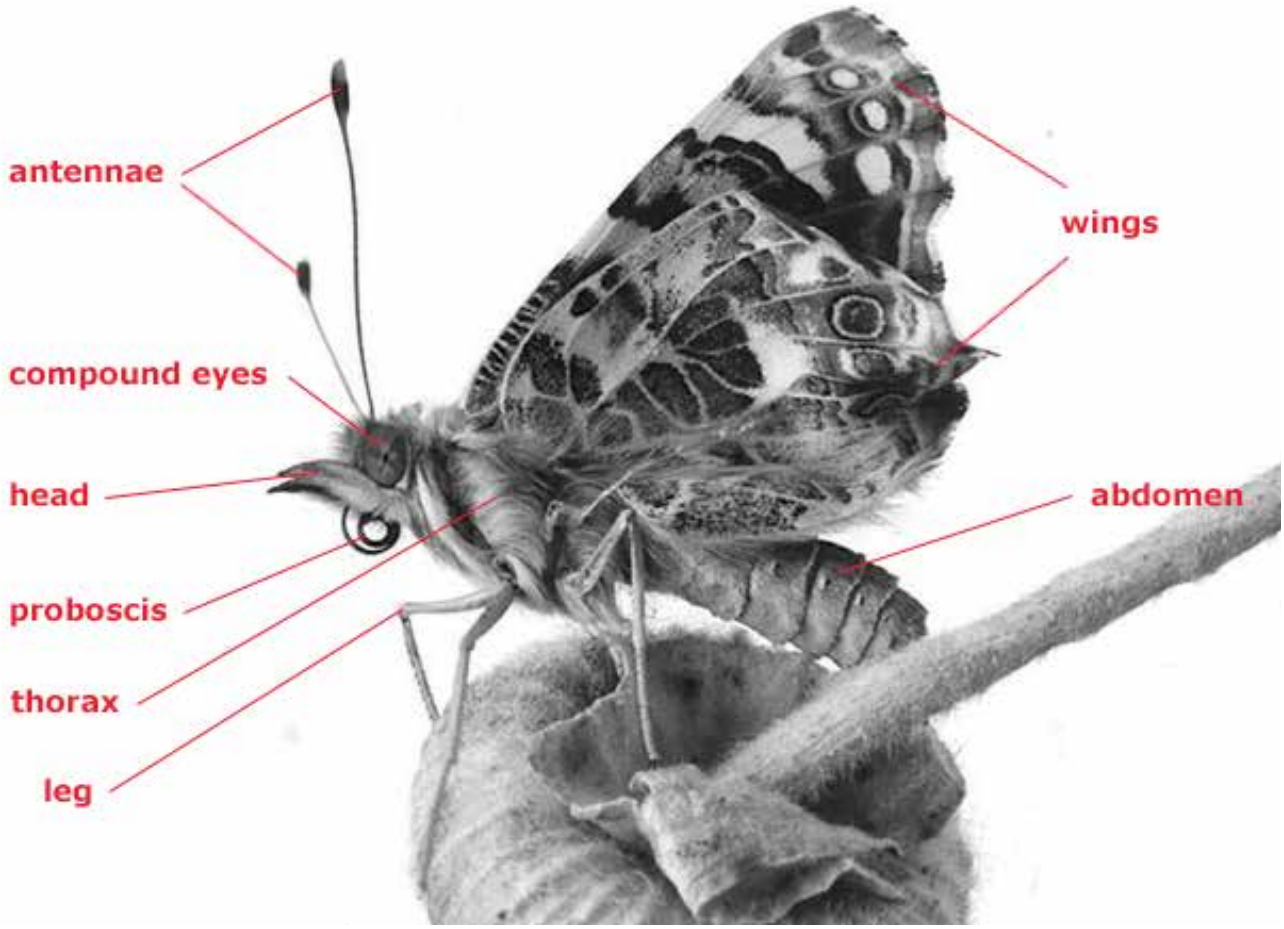
centipede



butterfly

BUTTERFLY LAB

Butterfly Body Parts



Abdomen–the hind part of the butterfly includes the stomach, heart and other organs

Antennae–on the butterfly's head, used to taste the air and help with balance

Compound eyes–thousands of tiny lenses help the butterfly see in all directions

Head–the head includes the proboscis, 2 antennae and 2 compound eyes

Leg–the butterfly has 6 legs, in 3 pairs, attached to its thorax

Proboscis–the butterfly tongue, which works like a drinking straw

Thorax–the midsection of the butterfly with 3 pairs of legs & 2 pairs of wings

Wings–2 pairs of wings on the thorax allow the butterfly to fly

BUTTERFLY LAB

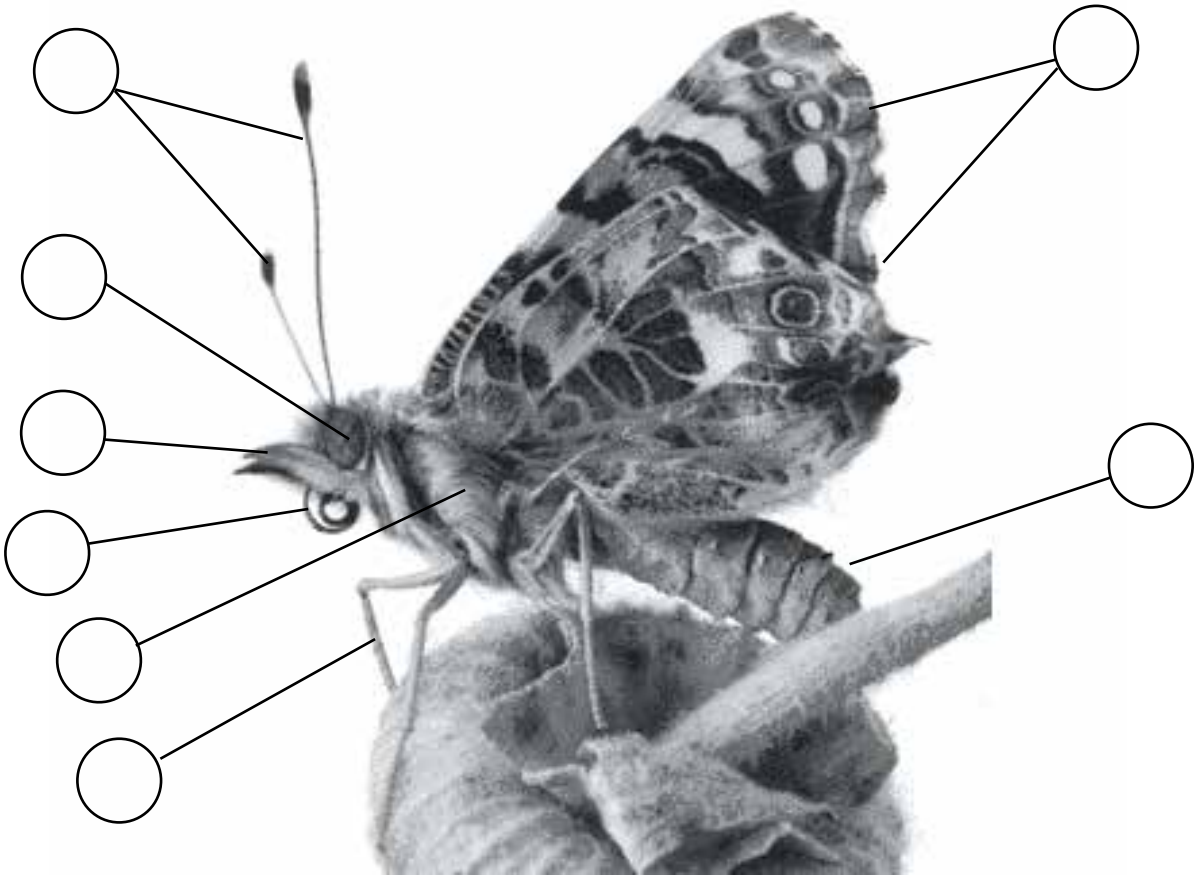
Butterfly Body Parts

Name _____

Date _____

Can you match the words on this page to the correct body parts on the butterfly? All you have to do is write the correct letter inside each circle.

A wings B antennae C head D thorax
E abdomen F leg G compound eye H proboscis



BUTTERFLY LAB

KEY: Butterfly Body Parts

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All you have to do is write the correct letter inside each circle.

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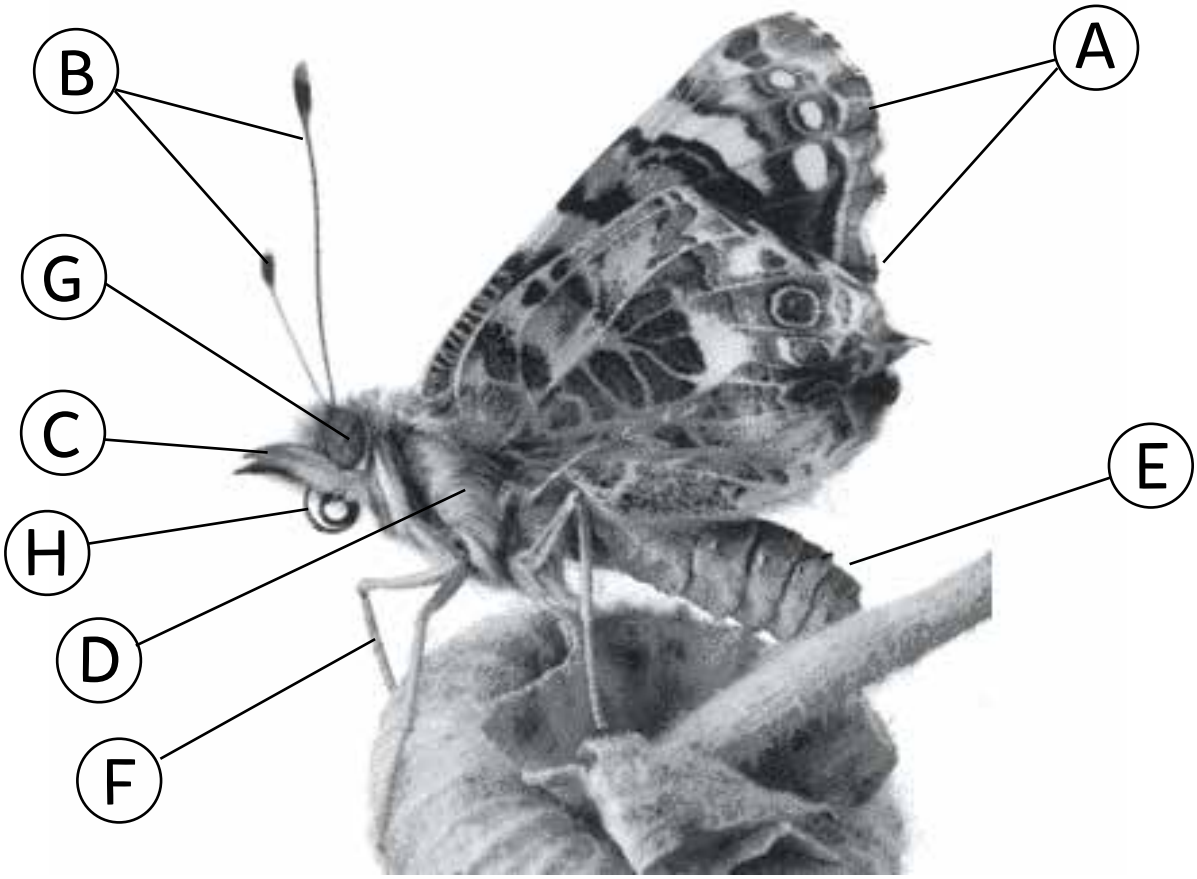
E abdomen F leg G compound eye H proboscis



BUTTERFLY LAB

Build a Butterfly Model

Objectives
Students will practice team work
Build models to demonstrate their learning and for presention to the class

Materials
Construction paper, tag board, glue, staples, pipe cleaners, old magazines, boxes, cardboard for construction

Directions
In groups of 2-3, the students will build an large-scale model of a butterfly. The models should be 1-1.5 feet across and may be built with a variety of materials. The finished models will be displayed on desks and tables as if the models are part of an Butterfly Museum.

1. In advance using library books or websites, select 8-10 butterfly species for a variety of colors and wing shapes. Print out or make copies of good photographs of each species. Record the common name and where they are found on paper slips. You can also find butterfly photographs at EarthsBirthday.org/NM.

Divide the students into small groups of 2-3 students. Tell the students that they will be building a Butterfly Museum.

As a class, look at the photographs of the different butterflies. Ask the students to look closely and discuss the different wing shapes and colors. If the butterflies are on flowers or plants, notice their differences too.

Have the groups draw the paper slips out of a hat. Or let each group select a butterfly that they want to model.

2. Try making a prototype from scrap paper. It's a great way to figure out construction issues.

3. Build an enlarged, close up model of the butterfly on a cardboard base or box bottom. Glue the common name and location of the butterfly on the base.

4. Take a 'tour' of the museum. At each display, the small group can give a presentation of how they built their model and the materials they used.

Advanced: Have 1-2 groups with strong skills build a solution to a human problem by mimicking how butterfly body parts help them survive and meet their needs. For example, a butterfly's exoskeleton could be like armor for a firefighter, or their compound eyes could help us see 360 degrees around.

BUTTERFLY LAB

What Does Each Body Part Do?

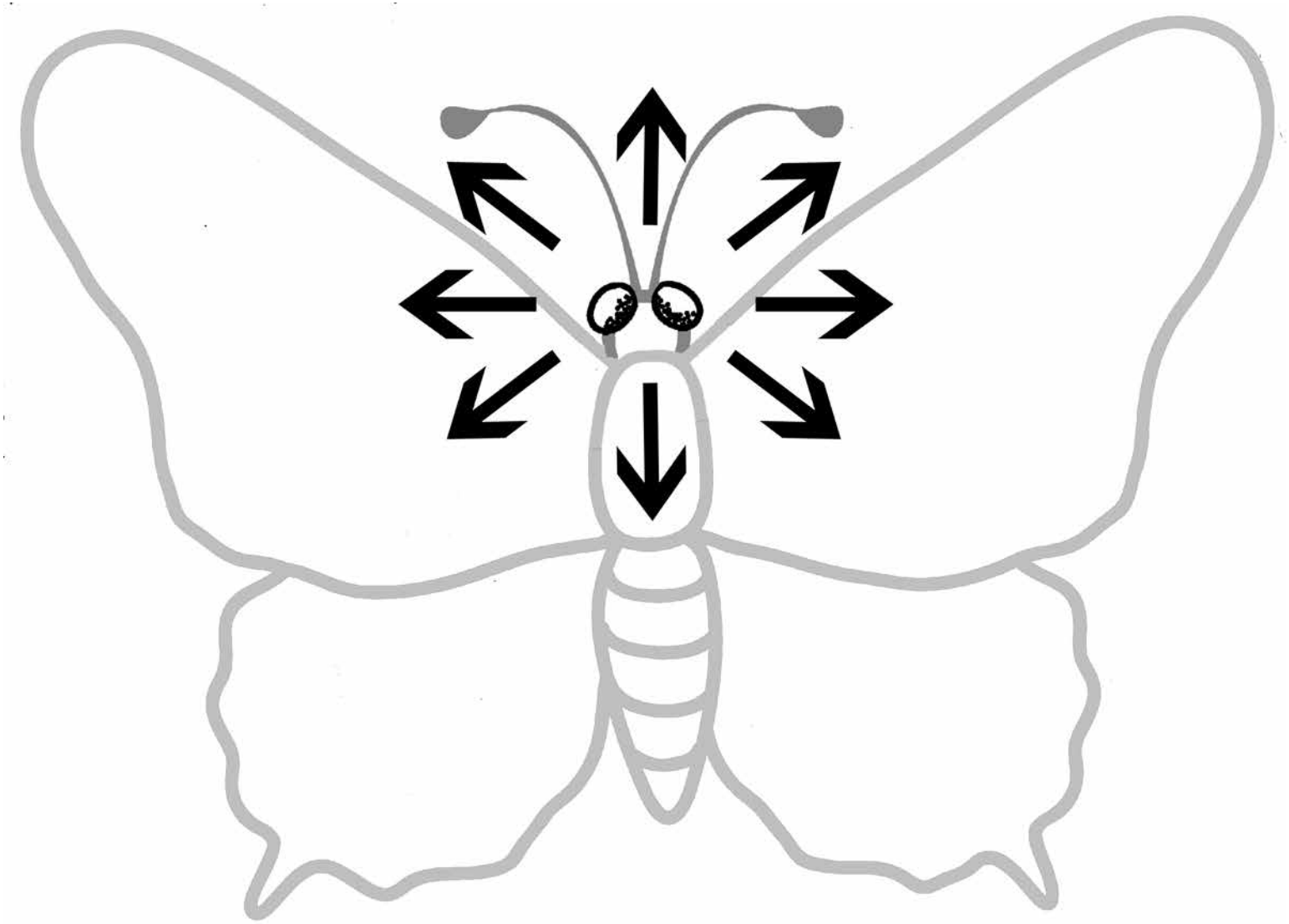
Objective
As the students begin to understand the basic parts of a butterfly's body, it is useful for them to also understand the ways that a butterfly's body helps it to survive.

Step One
Project the following 5 statements/images on the whiteboard for the class. Read the statement out loud and pointing to the illustration or photograph, describe the important body parts and what they are doing. Ask the students if there are any words that they don't understand. Ask them about the action in the statement. For example, *why is the butterfly flying from flower to flower? Is it looking for something?*

Step Two
Print out the worksheet for each student. Tell the students that they will be reviewing the 5 statements about butterfly body parts. They will need scissors and glue to complete the worksheet. You can have the students work on their own or as a class, read each statement out loud one at a time and have instruct them to select the correct word, cut it out with their scissors and glue it in the box. Go on to the next statement together.

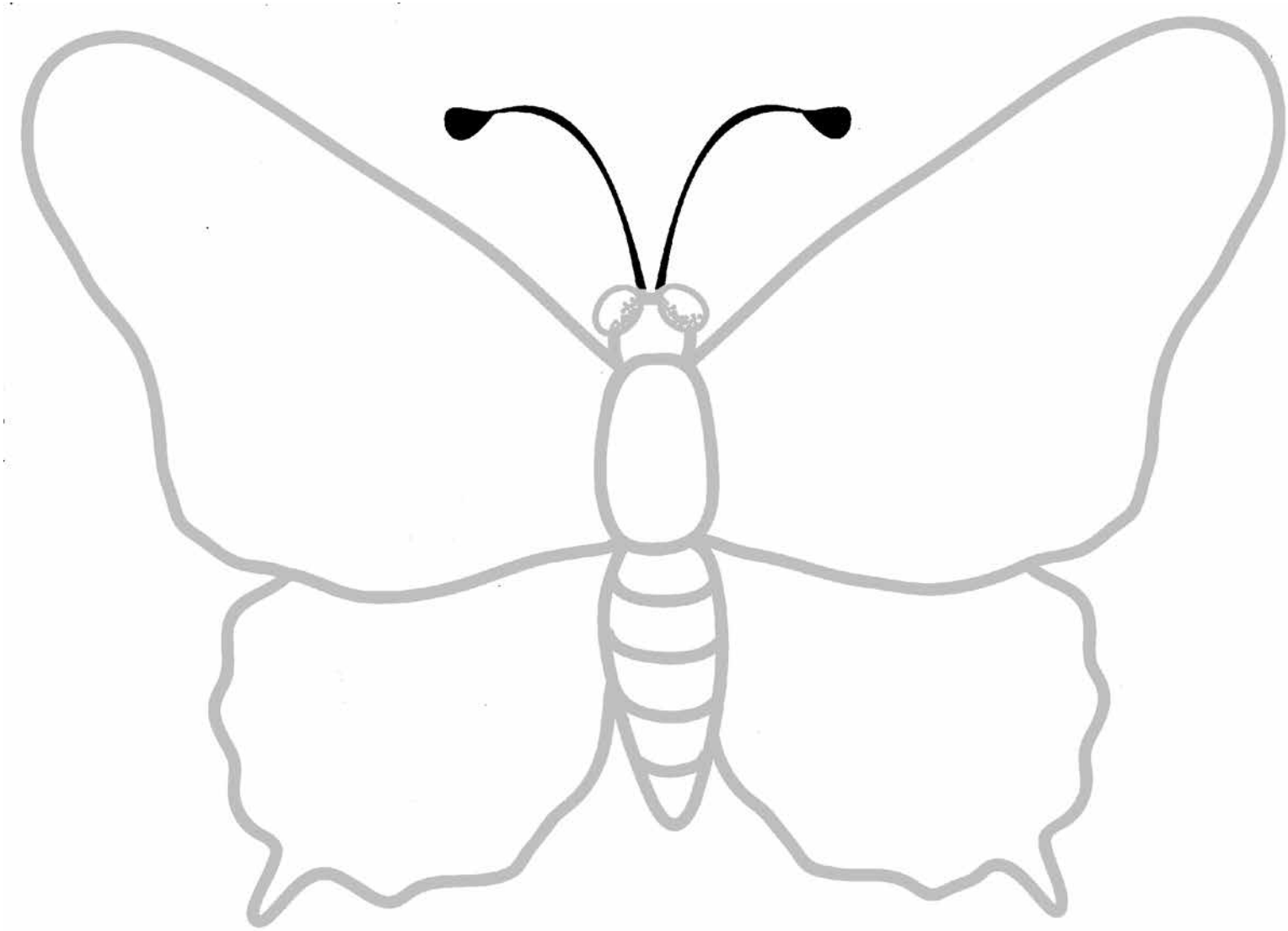
The four wings fly from flower to flower.

The proboscis drinks nectar like a straw.



The compound eyes see danger in all directions.

Six legs hold on to branches in the wind.



Two antennae smell where food is.

BUTTERFLY LAB

What Does Each Body Part Do?

Name _____

Date _____

Cut out the 5 words at the bottom.
Read the 5 sentences and glue the correct body part in the blank.

The four _____ fly from flower to flower.

The _____ drinks nectar like a straw.

The compound _____ see danger in all directions.

Six _____ hold on to branches in the wind.

Two _____ smell where food is.

---

legs eyes wings

proboscis antennae

BUTTERFLY LAB

Post Assessment

Repeat the assessment with your students and compare the pre assessment and post assessment for each student on the rubric.

BUTTERFLY LAB

Celebrate the Earth!

Each school celebrates the Earth's Birthday a little differently, bringing their own unique ideas and interests to the event. Get creative!

Many schools choose a day close to the end of the school year, when the weather's warm, to celebrate by planting seeds, releasing butterflies and demonstrating ways to care for our home planet.

Your celebration is a special gift from the children to the Earth!

Here are some activities for your classrooms to share:

- Sharing a song that students learned in the Butterfly Lab
- Planting seeds in a school garden
- Creating an art project from recycled materials
- Releasing Painted Lady butterflies
- Students can draw pictures of their favorite animal, flower or tree
- Students reporting on ways to care for the earth like saving water, feeding birds, growing vegetables and more

At the close of your celebration, please remember to take the **Earth's Birthday Pledge**!

No job is too big,
No action too small
For the care of the Earth
Is the task of us all!

10 BUTTERFLY PHOTOGRAPHS

Teacher's Guide
1st Grade Supplement

BUTTERFLY LAB

CELEBRATE PLANET EARTH

1 800 698 4438
CelebratePlanetEarth.org

Buckeye Butterfly

Photo: David E. Hill, commons.wikimedia.org.jpg

Common Grass Yellow Butterfly

Photo: J.M.Garg, commons.wikimedia.org.jpg

Monarch Butterfly

Photo: Kenneth Dwain Harrelson, commons.wikimedia.org.jpg

Statira Sulphur Butterfly

Photo: Didier Descouens, commons.wikimedia.org.jpg

Scarce Swallowtail Butterfly

Photo: Stella Vješnica, commons.wikimedia.org.jpg

Sara Longwing Butterfly

Photo: DirkvdM, commons.wikimedia.org.jpg

Red-bodied Swallowtail Butterfly

commons.wikimedia.org.jpg

Palawan Birdwing Butterfly

Photo: Mark Pellegrin, commons.wikimedia.org.jpg

Mountain Apollo Butterfly

Photo: Wenkbrauwalbatros, commons.wikimedia.org.jpg

Common Jezebel Butterfly

Photo: Jee & Rani N, commons.wikimedia.org.jpg