BUTTERFLY WONDER

Teacher's Guide Kindergarten Science Unit



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Acknowledgements



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LOS ALAMOS NATIONAL LABORATORY FOUNDATION



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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Overview



Teacher's Guide

This hands-on lab for preK and kindergarten science builds experiences and skills for observing caterpillars, characteristics of insects and understanding an insect's needs.

The lab includes Pre and Post Assessments with 12 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	Т	W	Th	F	Sa
			Day 1 Pre Assessment	Day 2 What We Know & What We Learned	Day 3 Read Aloud Oh Look, A Butterfly!	Day 4
Day 5	Day 6 Planting Sunflower Seed Cups	Day 7 Looking & Learning Day-by-Day	Day 8 Butterfly Songs	Day 9 A Changing Dance	Day 10 Word Wall	Day 11
Day 12	Day 13 Counting Mats	Day 14	Day 15 Is It a Caterpillar? Or Not a Caterpillar?	Day 16	Day 17 What Are the Parts of a Butterfly?	Day 18
Day 19	Day 20	Day 21 Thumbprint Art	Day 22 Post Assessment	Day 23 Celebrate the Earth!	Day 24 Summer Take-Home	

Overview

Choose 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. Make copies of all the handouts in advance. *Read Aloud Storybook* with your students.

Start learning about butterflies with 3 songs and an imaginative dance. The songs are simple, using familiar tunes with a call and response structure. The songs are about insect body parts and the butterfly life cycle.

You can also introduce the unit with Is A Butterfly An Insect? Mini-Book to learn about insect body parts.

The Caterpillars Are Here

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

Begin using the What Is It Today? Bar Graph right away. These activities introduce your students to thinking & acting like scientists—looking closely, recording information and learning from results. Build your science vocabulary using the Word Wall.

When the caterpillars have grown a little bit, take the Is It a Caterpillar? Or Not a Caterpillar? Quiz.

Continue observing the caterpillars each day, recording what you see on the What Is It Today? Bar Graph. Sing the songs to have fun and get the wiggles out as often as you like.

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. Your class can study What Are the Parts of a Butterfly? Do some creative integration with Thumbprint Art.

Remember to do a Post Assessment with your students.

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! Sing songs and say goodbye.

- 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.

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

Standards Rubric: Kindergarten

KINDERGARTEN Common Cor	on Core: English Language Arts Standards Reading: Informational Text
Key Ideas and Details:	
CCSS.ELA-Literacy.RI.K.1	With prompting and support, ask and answer questions about key details in a text.
CCSS.ELA-Literacy.RI.K.2	With prompting and support, identify the main topic and retell key details of a text.
CCSS.ELA-Literacy.RI.K.3	With prompting and support, describe the connection between two events, or pieces of information in a text.
Craft and Structure:	
CCSS.ELA-Literacy.RI.K.4	With prompting and support, ask and answer questions about unknown words in a text.
CCSS.ELA-Literacy.RI.K.5	Identify the front cover, back cover, and title page of a book.
CCSS.ELA-Literacy.RI.K.6	Name the author and illustrator of a text and define the role of each in presenting the information in a text.
Integration of Knowledge and Ide	ind ideas:
CCSS.ELA-Literacy.RI.K.7	With prompting and support, describe the relationship between illustrations and the text in which they appear.
CCSS.ELA-Literacy.RI.K.8	With prompting and support, identify the reasons an author gives to support points in a text.
CCSS.ELA-Literacy.RI.K.9	With prompting and support, identify basic similarities in and differences between two texts on the same topic.
Range of Reading and Level of Tex	l of Text Complexity:
CCSS.ELA-Literacy.RI.K.10	Actively engage in group reading activities with purpose and understanding.
Next Generation Science Standards	andards
K-LS1	From Molecules to Organisms: Structures and Processes
	Use observations to describe patterns of what plants and animals (including humans) need to survive.
LS1.C	All animals need food in order to live and grow. They obtain their food from plants or from other animals.

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 that:

- · all living things have needs
- · they can understand the needs of other living things
- · they can 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 - Students can understand 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 - They can 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. It is practical experience in understanding the needs of others and learning how to help.

Sending the Read Aloud Storybook list home at the end of the school year gives the children an opportunity to share what they learned with their families. Being responsible to care for plants and pollinators is a good 'job' even for young children.

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 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 butterfly.
- Tell the students that they will be identifying the parts of a butterfly 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 ANTENNAE.
- Point to the word ANTENNAE and say it out loud. Ask the students to look at the butterfly and identify the ANTENNAE. Point out the ANTENNAE on the butterfly and then draw a line from the word to that body part.
- Next point out and say the word HEAD. Ask the students to identify the HEAD on the illustration and draw a line from the word to that part.
- Repeat with the words THORAX, WINGS, LEGS and ABDOMEN.
- 2 On the handout, focus on what a caterpillar needs to grow.
- · Caterpillars need FOOD, WATER, SUN and AIR to grow.
- Point to AIR and say it out loud. Ask *Does a plant need AIR to grow?* If it does need AIR, draw a circle around the illustration and word.
- Repeat with the words SOIL, SUN, SHOVEL, FOOD, WATER.

Assessment Record

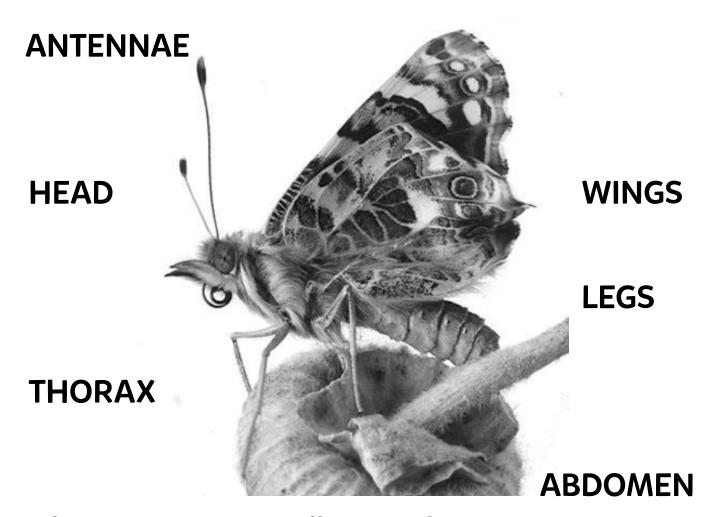
Student Name	Observing of Livin	Observing the Features of Living Things Ability to identify a butterfly and the parts of a butterfly		Needs of Living Things			
	Ability to ident			Ability to describe what a caterpillar needs to grow			
	Pre	Post	Pre	Post			
		_					

Name _____

Date _____

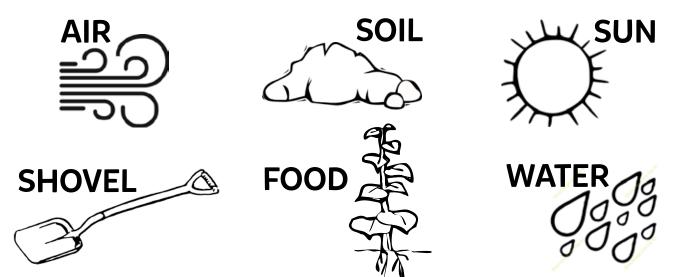
Parts of a Butterfly

Draw a line from each word to a part of the butterfly.



What Does a Caterpillar Need?

Circle the things a caterpillar needs.



What We Know about Butterflies



Overview

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

What We Know

Example of the diagram on the right

Time

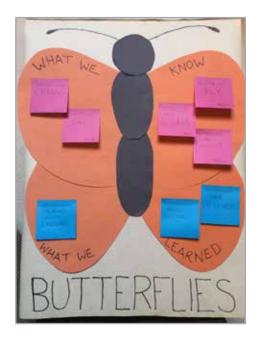
30 minutes

Materials

construction paper, post-it notes, color markers, bulletin board

Step One

Explain to students that you'll be observing caterpillars and butterflies in your classroom and learning all about them. Explain that this activity gives students a chance to talk about what they alreeady know about caterpillars and butterflies.



Step Two

Ask the class to tell you - one at a time - what they know about caterpillars and butterflies. Write the answers on a post-it note with the student's name.

Talk about the responses. Encourage the students to look for relationships between the responses and to group them in appropriate categories on a wing – i.e. needs, growing, parts of an insect, etc.

Step Three

Explain that as the class makes observations and learns new facts, you will write down What We Learned on the diagram.

Read Aloud Storybooks



Reading the storyook aloud with your class is a wonderful way for your students to learn about a butterfly's life, learn new vocabulary and build close observation skills. Reading the story several times with your students will provide greater vocabulary gains. The vocabulary will also be repeated and reinforced by What Is It Today?, singing the songs included here, as well as the other handouts and activities in the Butterfly Lab.

Here are a few ideas to enliven multiple readings of storybook:

- · Call & Response you read a line and the children repeat it back to you.
- Close Observation point out details in the illustrations as you read and during other readings, ask students to describe details in the illustrations.
- Relate to Live Caterpillars & Butterflies as the caterpillars grow and transform, relate events in the story to the children's observations of the insects.

Suggested storybooks: Waiting on Wings

by Lois Ehlert

The Very Hungry Caterpillar

by Eric Carle

A Butterfly is Patient

by Dianna Hutts Aston

Bye, Bye, Butterflies

by Andrew Larsen and Jacqueline Hudon-Verrelli

The Butterfly Alphabet Book

by Brian Cassie

A Place for Butterflies

by Melissa Stewart

Are You a Butterfly?

by Judy Allen and Tudor Humphries

Pinkalicious and the Little Butterfly

by Victoria Kann

Glasswings: A Butterfly's Story

by Elisa Kleven

Ten Little Caterpillars

by Bill Martin Jr. and Lois Ehlert

I'm a Caterpillar

by Jean Marzollo

Butterflies

by Emily Neye

Changing Butterfly Dance



Materials: Instrumental music and audio system

Simple Instructions: Guide students through an improvisational dance. Have students sit on the floor in a circle and ask them to imagine changing into butterflies—how eggs hatch caterpillars, caterpillars crawl, eat and grow, then become a chrysalis and finally emerge as a butterfly with wings. Show them how to curl up as eggs, then push out of the egg and wiggle like a growing caterpillar, then wrap themselves tight into a chrysalis and then spread arms and open hands as butterflies emerge. Fly as gently as a butterfly. Lead them through the process several times. Then let them try it on their own with music.

Use your dance often as a wake-up exercise or a break from study, allowing students to move and get the wiggles out.



"What Is It Today?" Graph

Observing the growth of the caterpillars every day is an excellent opportunity to build a variety of science literacy skills like looking closely, focus, a wider vocabulary and verbal expression.

- Each student should have a "What Is It Today?" Graph and the "What Is It Today?" Cut-outs.
- In small groups, ask the students to look closely at the tiny caterpillars. One at a time, have students describe aloud one detail that they see. Write key words on the whiteboard.
- Explain that the class is using the "What Is It Today?" handout to record and learn about how butterflies change. With Cut-outs, have the students choose a picture that looks the most like the insect today. Cut it out and paste it on Day 1 of the handout.
- Every day take a few minutes to observe the insects, select a picture and paste it on "What Is It Today?".
- Every 3-4 days, take a little more time for a class discussion and writing key words on the whiteboard. Can you see more details as the caterpillars grow bigger?
- Ask the students to describe colors, shapes, size and what it might be similar to. Use vocabulary from the Word Wall.
- When the class is ready to release the butterflies, interpret the graph together. Count and compare the number of days the insect was in each stage. Which stage was longest? Which was shortest? How long does an insect live?

The Painted Lady Butterfly Life Cycle

The Egg (3-5 days) Adult female butterflies lay their eggs on plants that Painted Lady caterpillars like to eat, like thistle or hollyhock. The eggs are the size of a pin head, each one containing a caterpillar beginning to grow.

The Larva or Caterpillar Hatches! (5-10 days) The hungry caterpillar eats constantly and grows quickly. As it eats, the caterpillar's skin gets tighter. Soon it sheds this tight skin, emerging with new skin underneath. Each caterpillar changes skin four times before it's fully grown.

The Chrysalis—Metamorphosis Begins (7-10 days) With a silk thread that comes out of a hole just below its mouth (spinneret), the caterpillar spins a silk pad to attach to. The caterpillar hangs from this pad. Soon, the caterpillars' skin splits open, from head to abdomen, revealing a dull, brownish case underneath—the chrysalis or pupa.

The Butterfly Emerges! (10-14 days)

When the butterfly first emerges from the chrysalis, its wings are soft and crumpled. The tired butterfly rests, and then slowly unfolds its wings to dry. After a few hours, the butterfly will be ready to fly. The Painted Lady Butterfly has a 10-14 day life span. During that time, its main goal is to reproduce and lay eggs so the cycle can begin again!

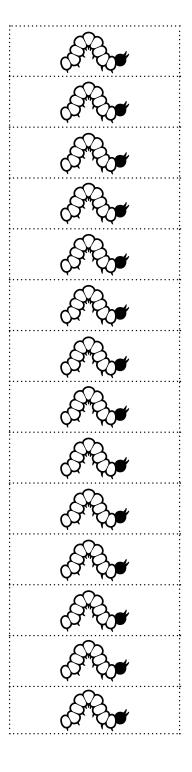
Name _____

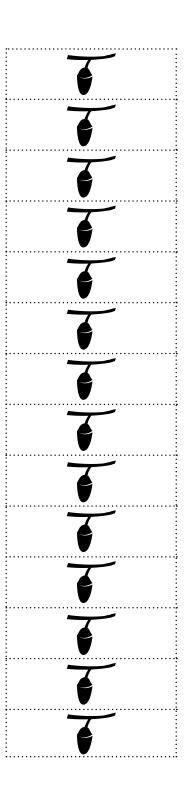
"What Is It Today?" Graph

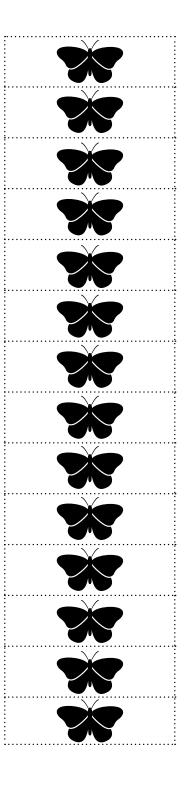
Did you observe a caterpillar, chrysalis or butterfly today? Paste a cut-out every day on the bar graph. On the day that you release your butterflies, write the word FLY in the rectangle.

14						14
13						13
12						12
11						11
10						10
9						9
8						8
7						7
6						6
5						5
4						4
3						3
2						2
1						1
DAY	CATERPILLAR	•	CHRYSALIS	•	Butterfly	DAY

"What Is It Today?" Cut-outs







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 antennae

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 butterfli-ies.
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 antennae.

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 antennae.

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 antennae. Two antennae.

One butterfly. One butterfly.

Ohhhhhhhh! CHORUS

Yes, I see five caterpillars.
Five caterpillars. Five caterpillars.
Four pretty wings.
Four pretty wings.
Three body parts. Three body parts.
Two antennae. Two antennae.
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 antennae.

One butterfly. One butterfly.

Ohhhhhhhh! CHORUS

For All The Butterflies

Sing to the tune of "Frère Jacques"



I'm a flower
Roots below Roots below
Soil, rain and sunshine
Soil, rain and sunshine
Watch me grow!
Watch me grow!

I'm an egg I'm an egg
On a leaf On a leaf
Soon I'll be a caterpillar
Soon I'll be a caterpillar
Watch me eat!

I'm a caterpillar

I'm a caterpillar

You're one too You're one too

Soon we'll both be butterflies

Soon we'll both be butterflies

Something new!

Something new!

I'm a chrysalis
Warm and dry
Warm and dry
Changing from the inside
Changing from the inside
Into a butterfly!
Into a butterfly!

I'm a butterfly I'm a butterfly
Flying all around
Flying all around
Looking for a flower
Looking for a flower
Searching up and down
Searching up and down

I'm a flower I'm a flower
Open to the sky
Open to the sky
I have lots of nectar
I have lots of nectar
For all the butterflies
For all the butterflies

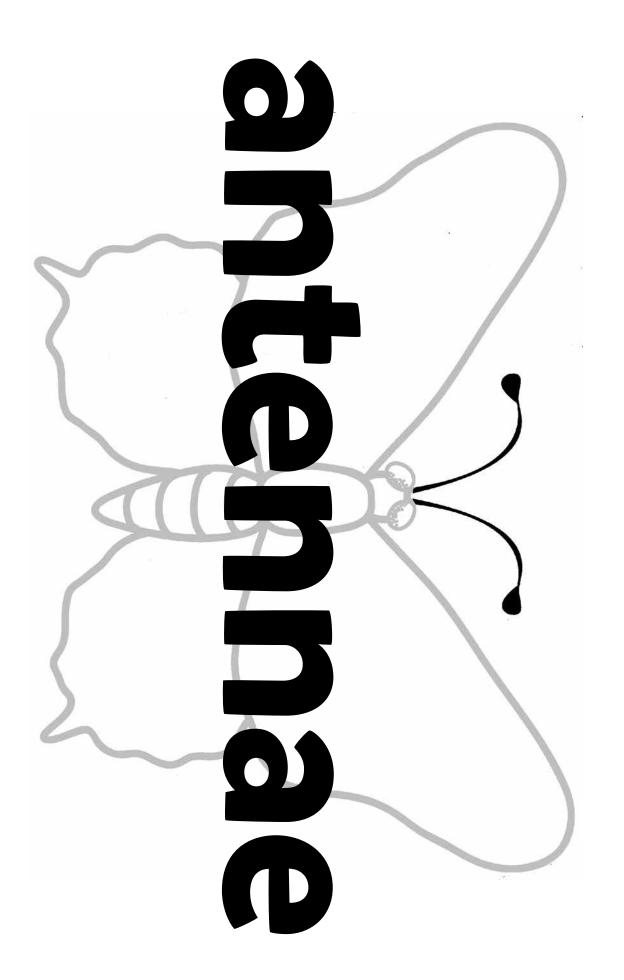
Butterfly Word Wall

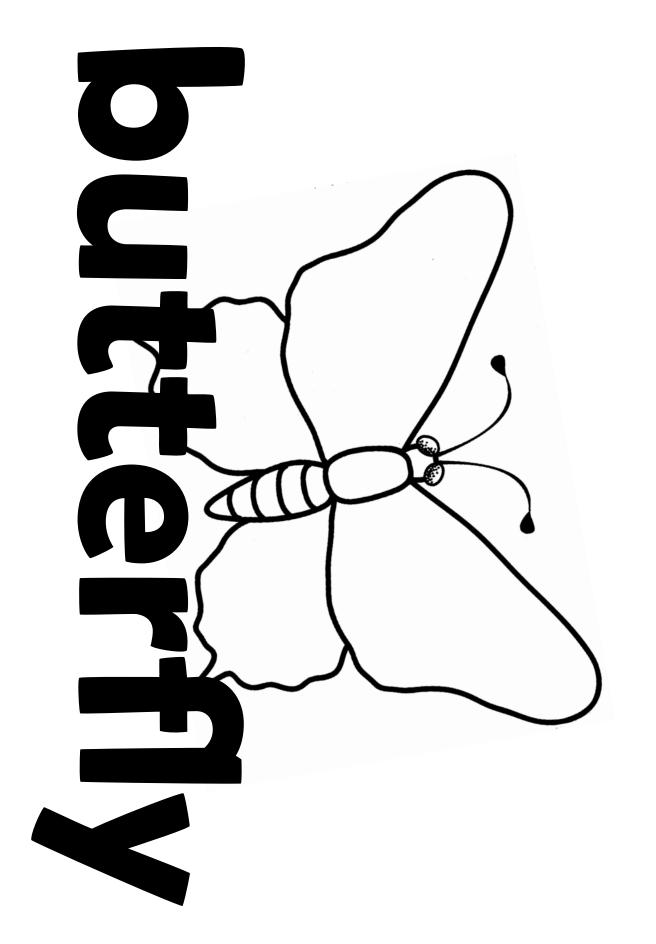


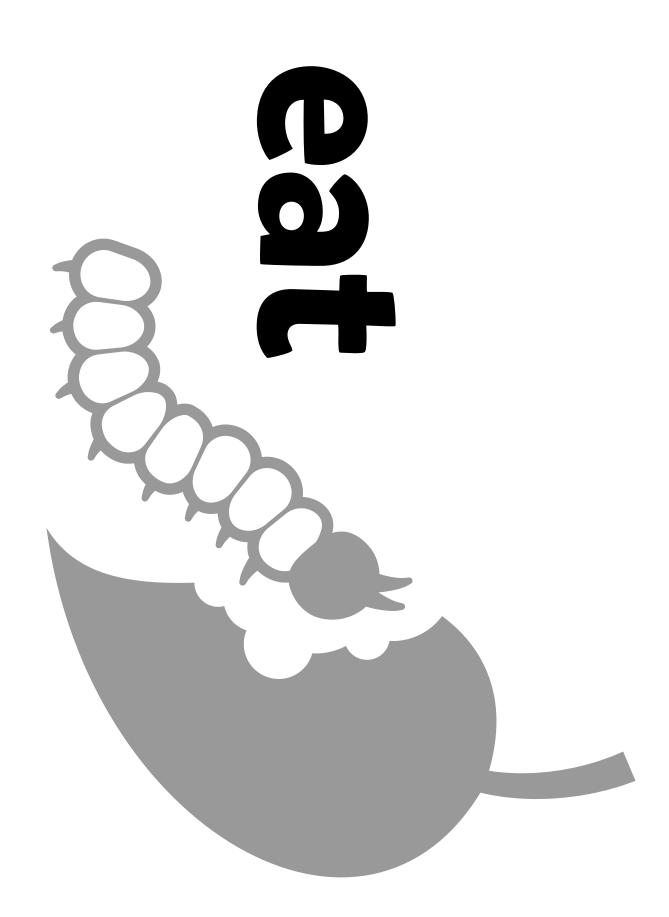
The Word Wall includes 20 words from storybooks and the songs we've offered. It is a set of domain-specific words that are all related to butterflies.

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 Live Caterpillars & Butterflies as your caterpillars grow and transform, encourage the children to use these vocabulary words to describe what they see.





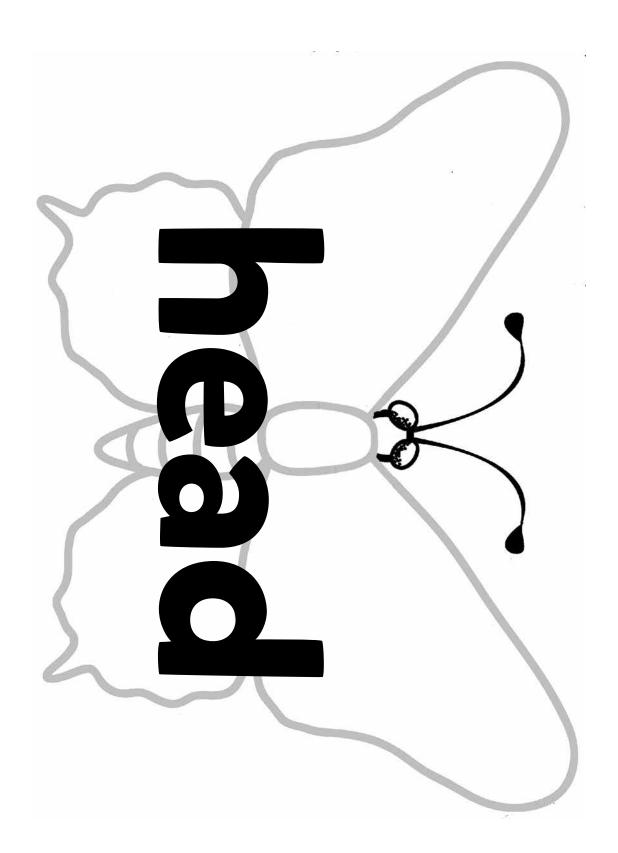




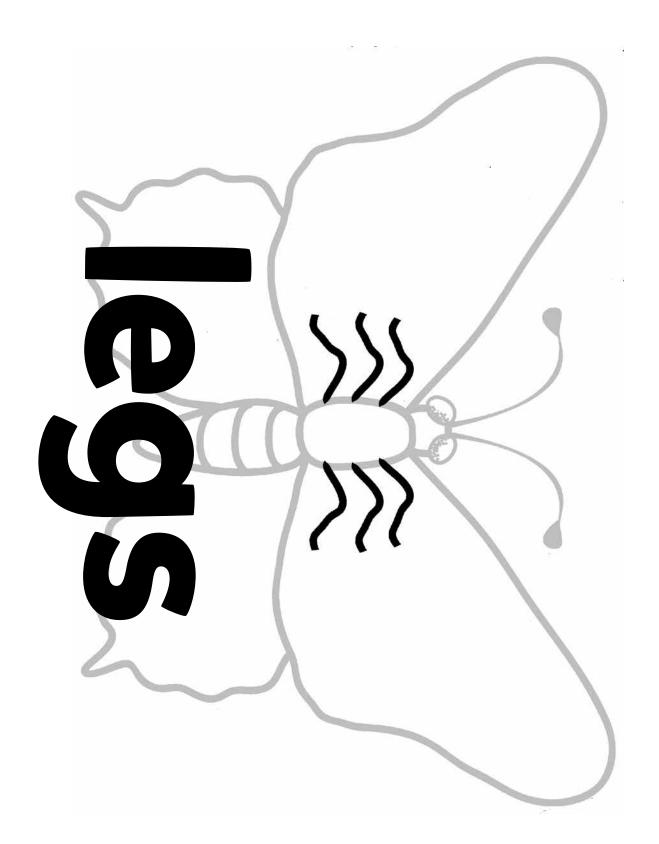
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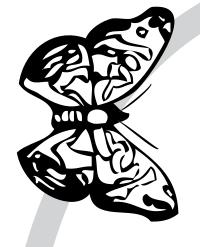
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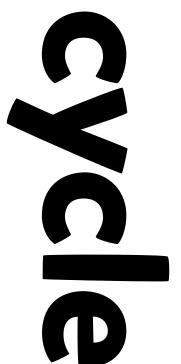










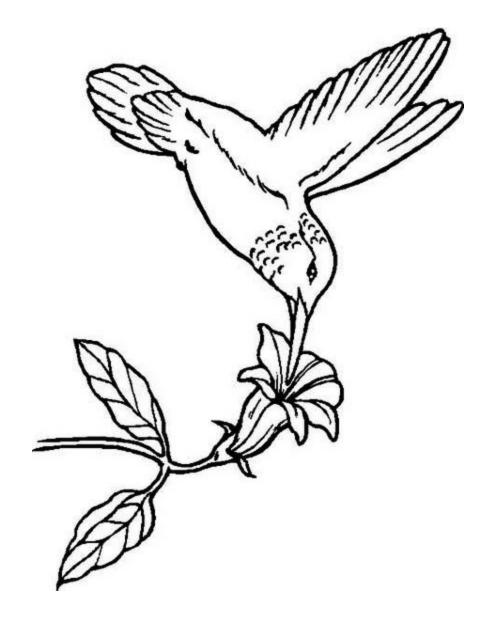


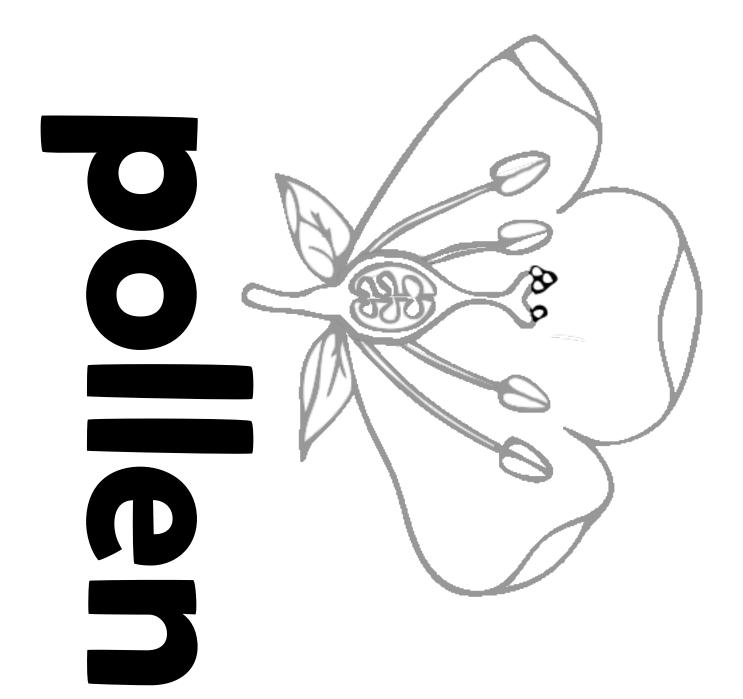


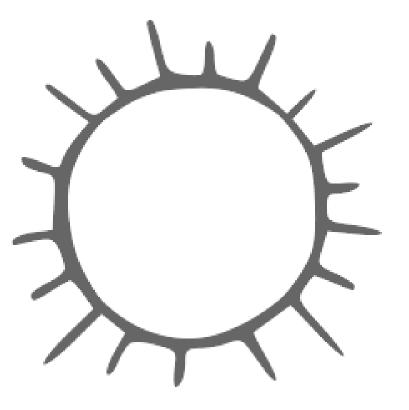


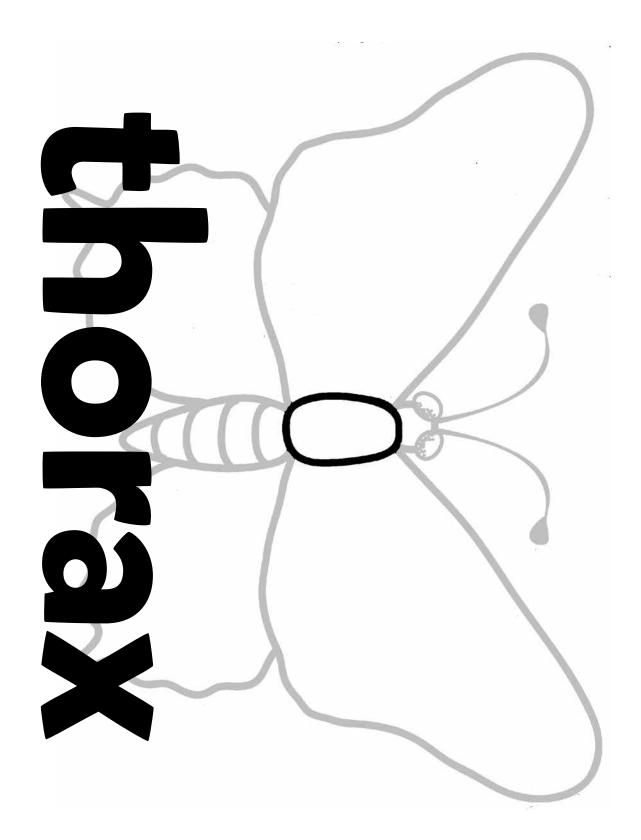


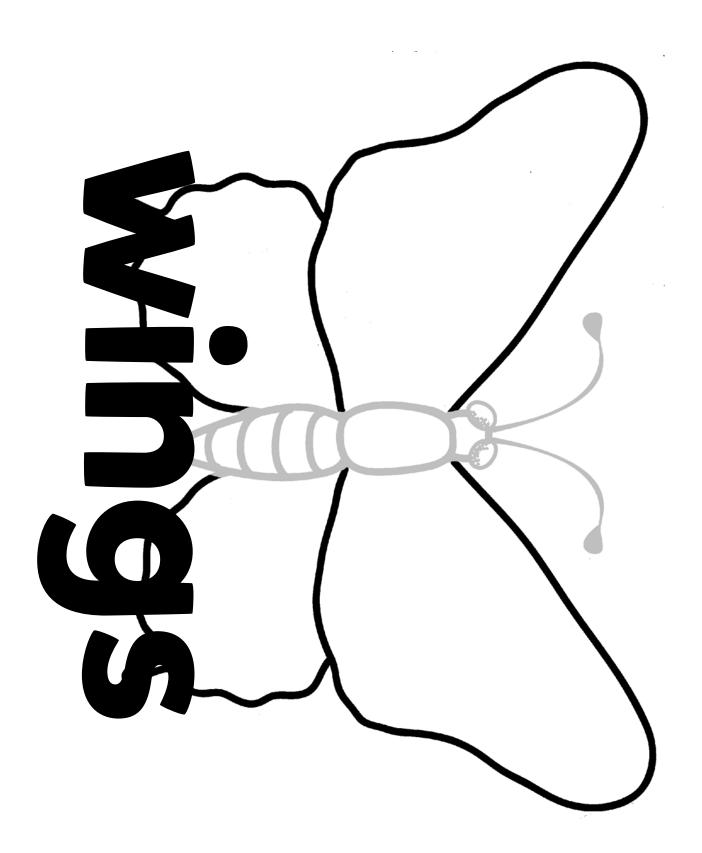
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Caterpillar Counting Mats 1-20

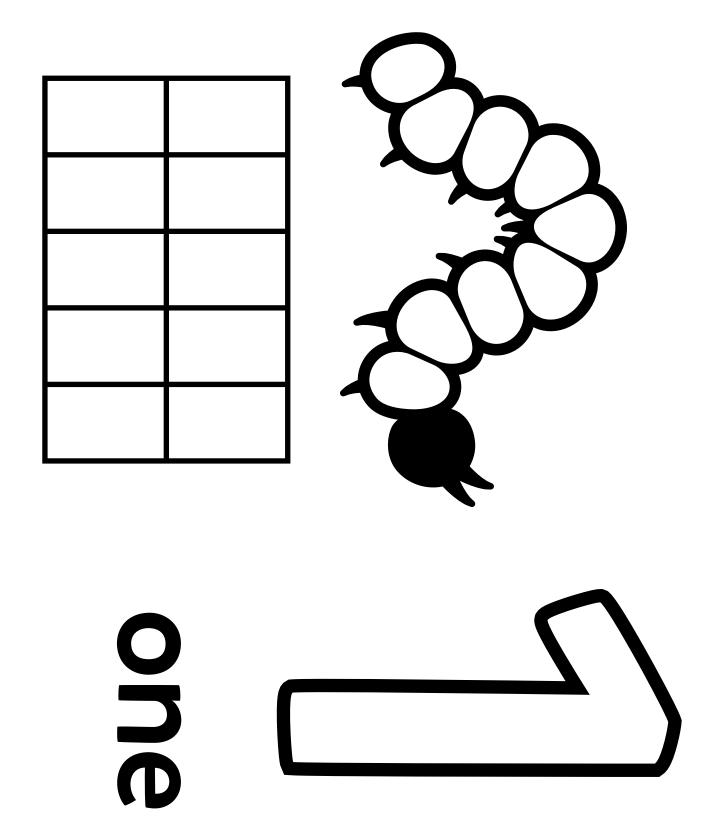


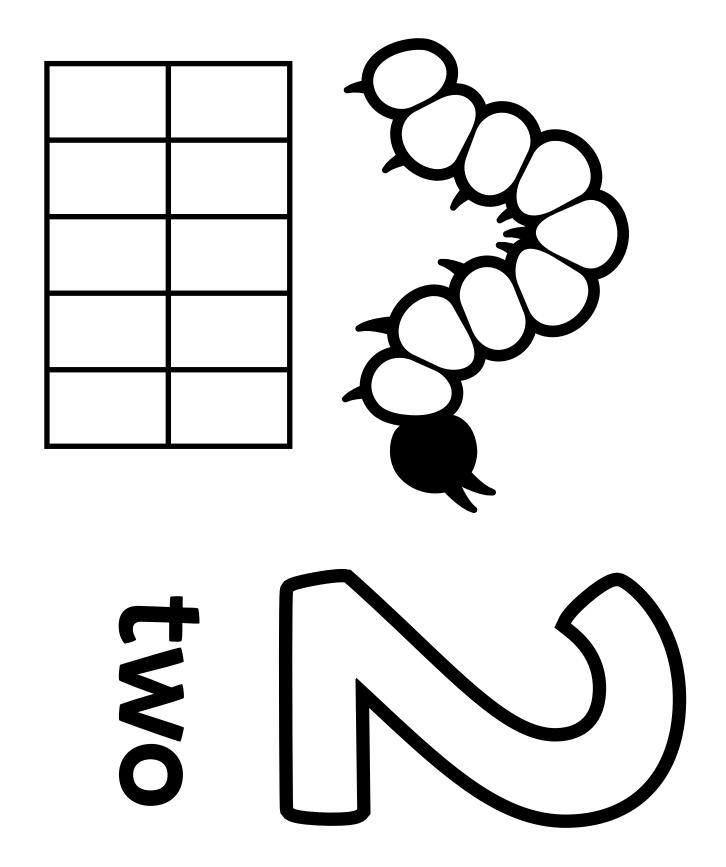
Caterpillar Counting Mats help children learn and count numbers 1-20 and develop motor skills by working with playdough or modeling clay.

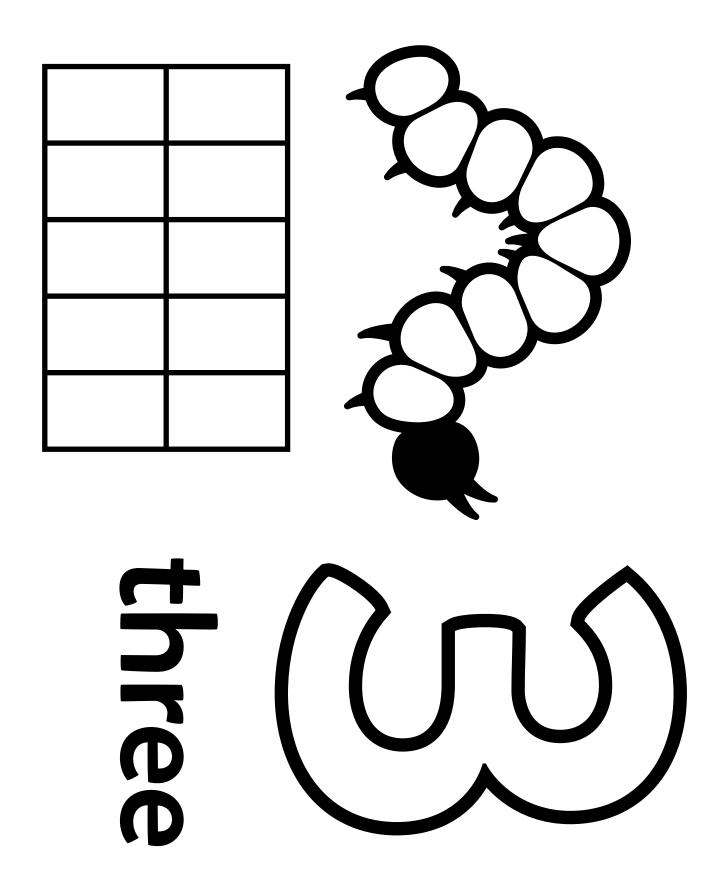
Print out one set of the counting mats and slide them into page protectors or laminate them for your math center.

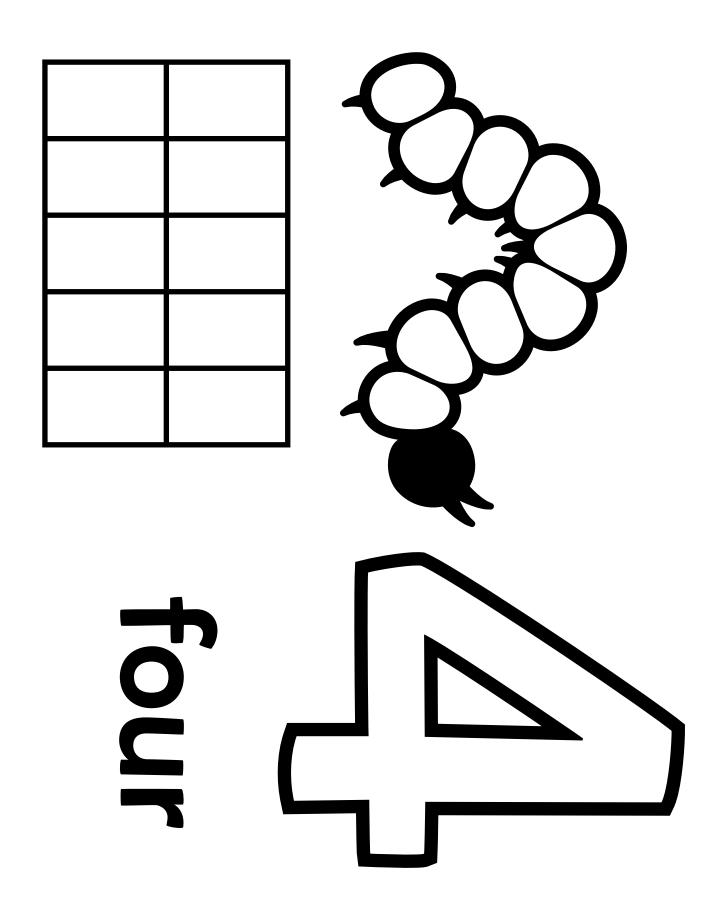
For counting put one object in each box. Use small balls of playdough, big buttons or paper clips as counting pieces.

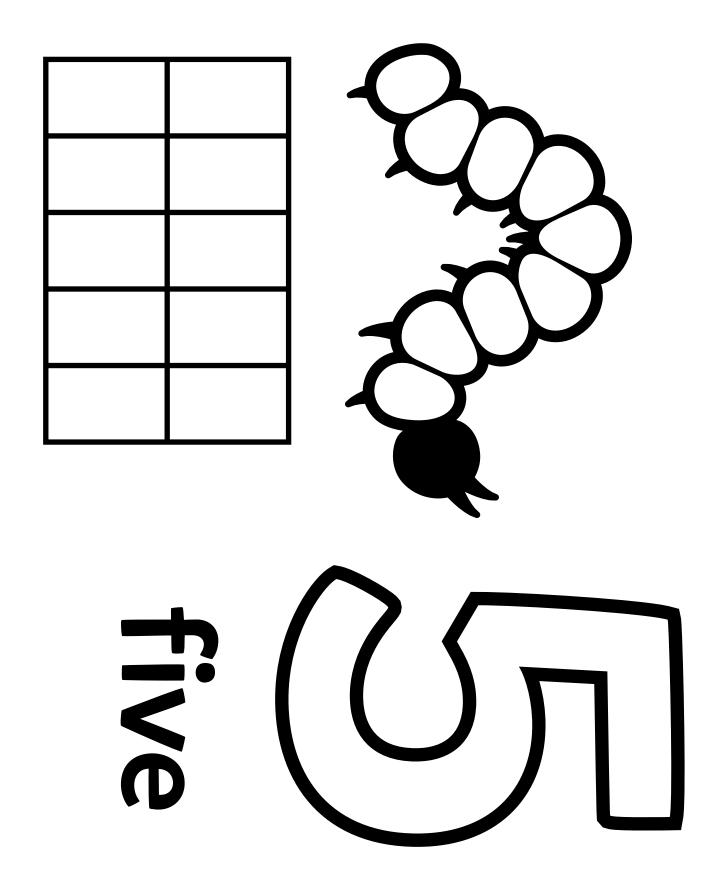
Make playdough snakes and shape them into the large numbers.

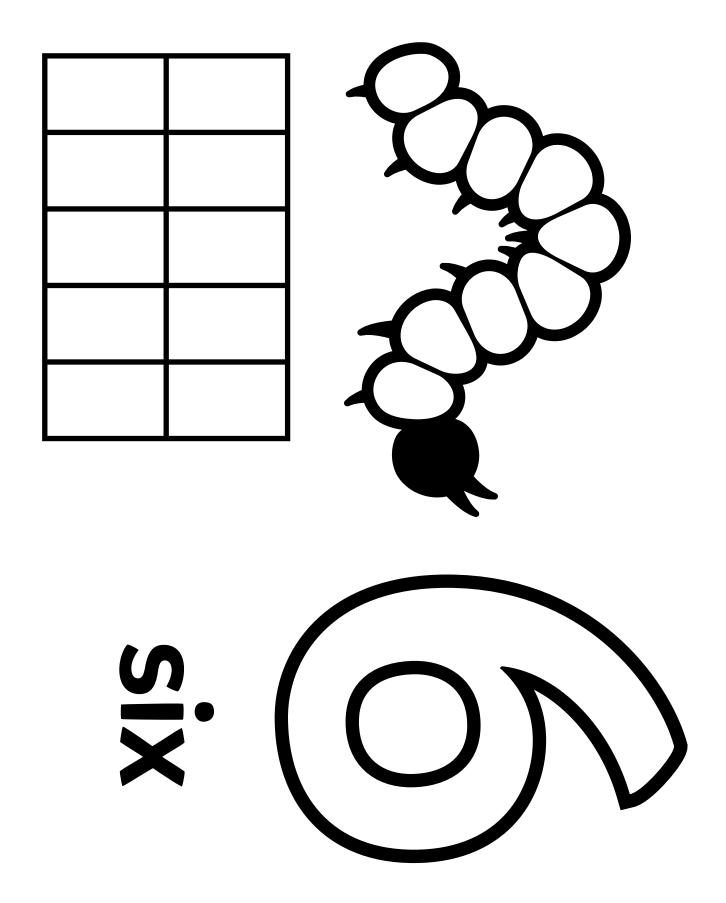


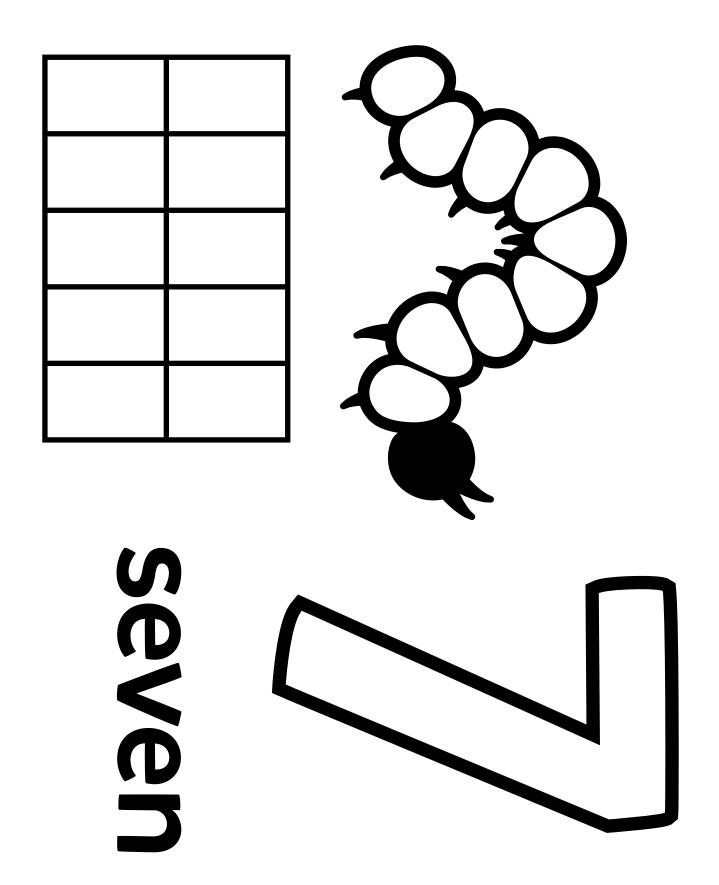


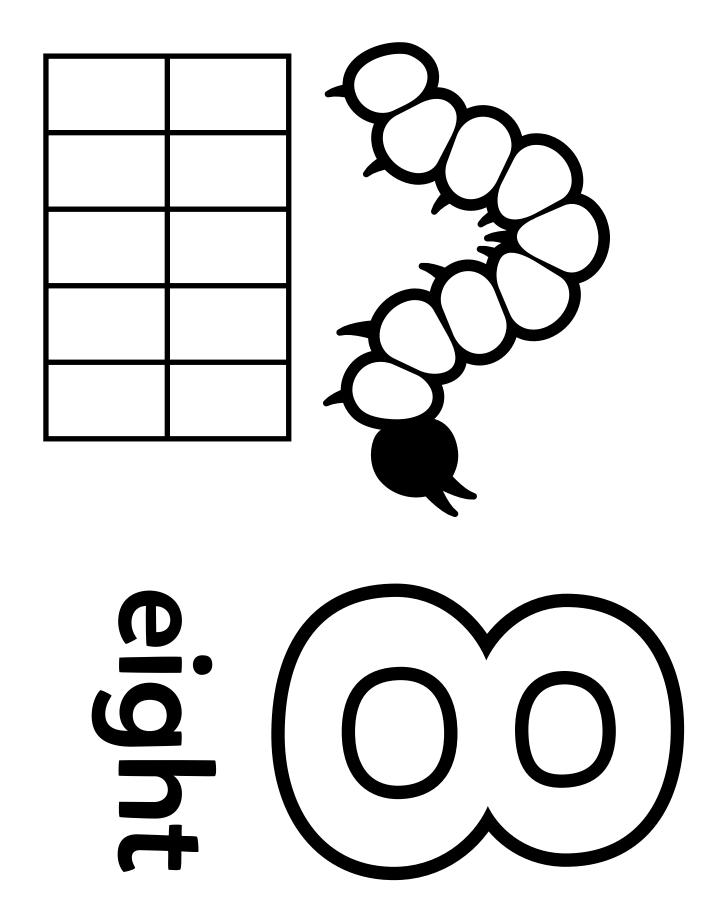


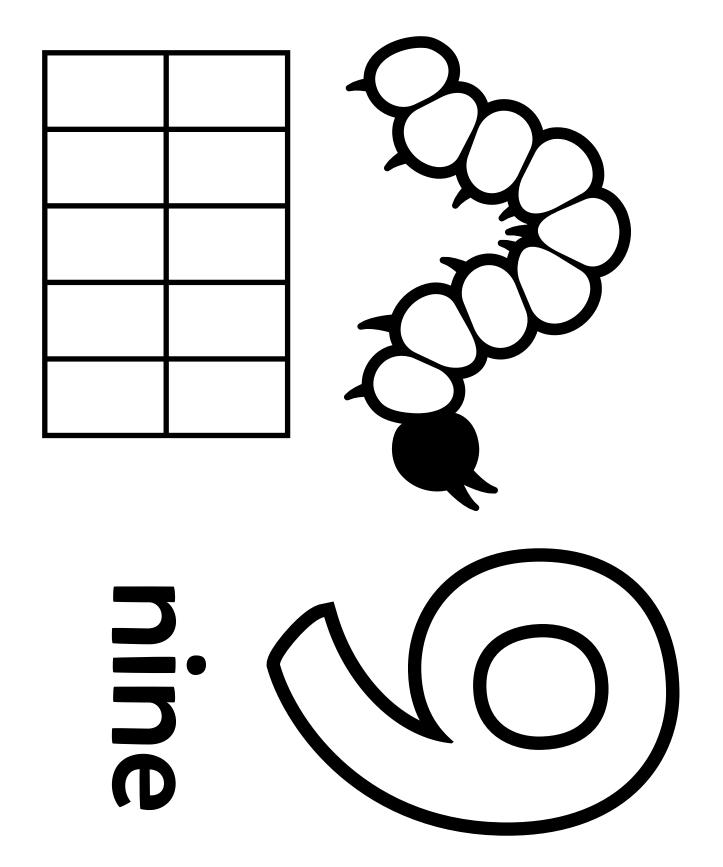


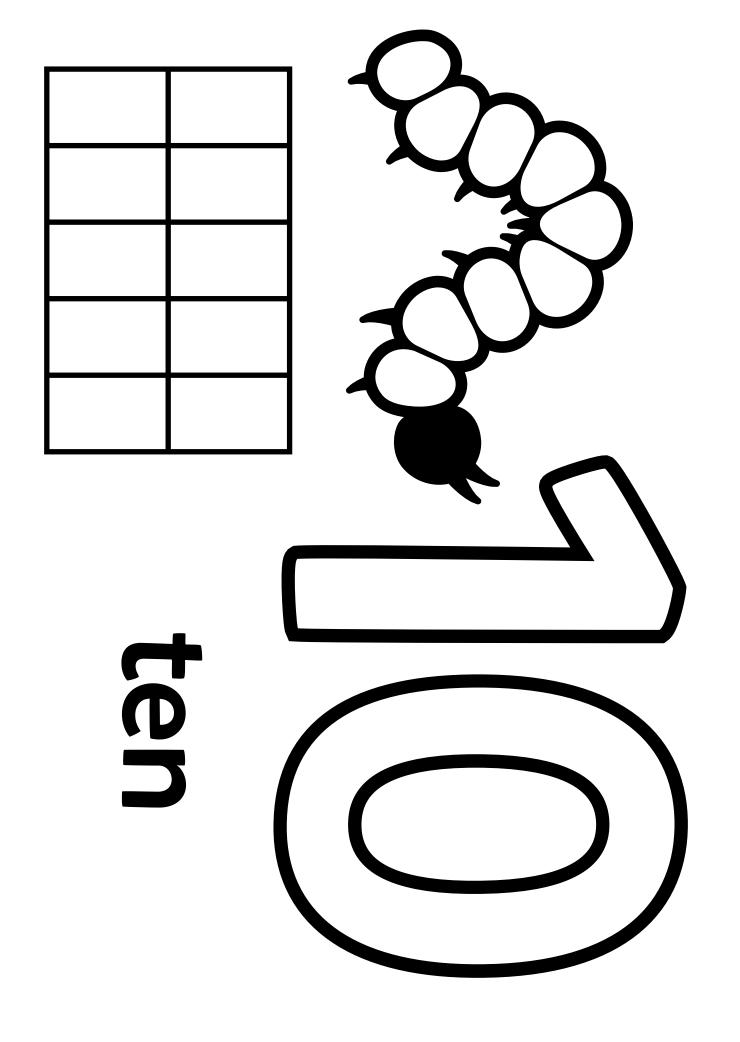


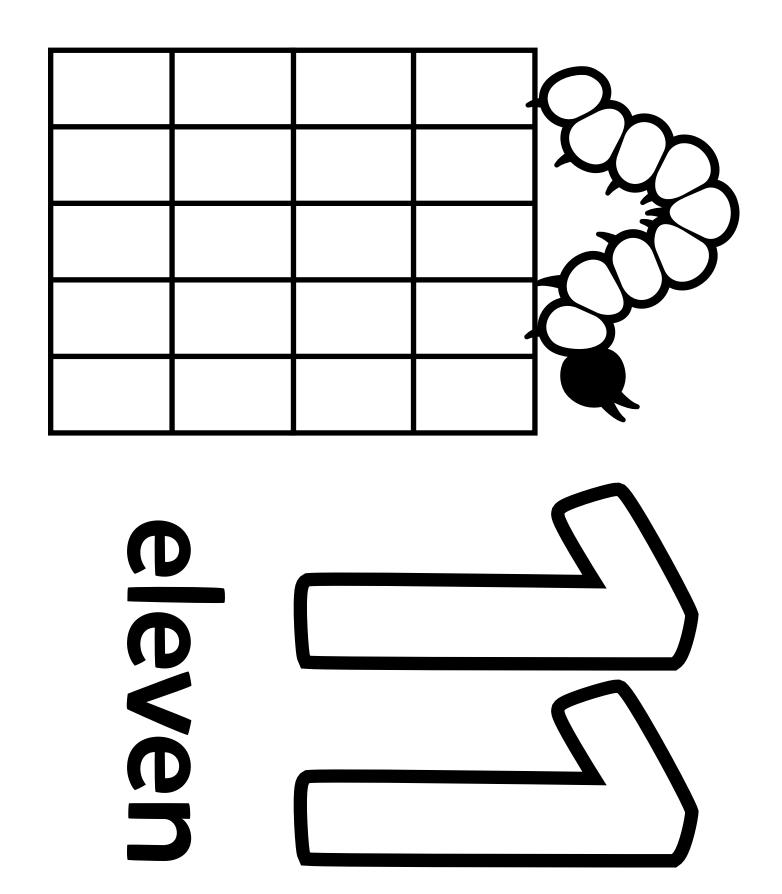


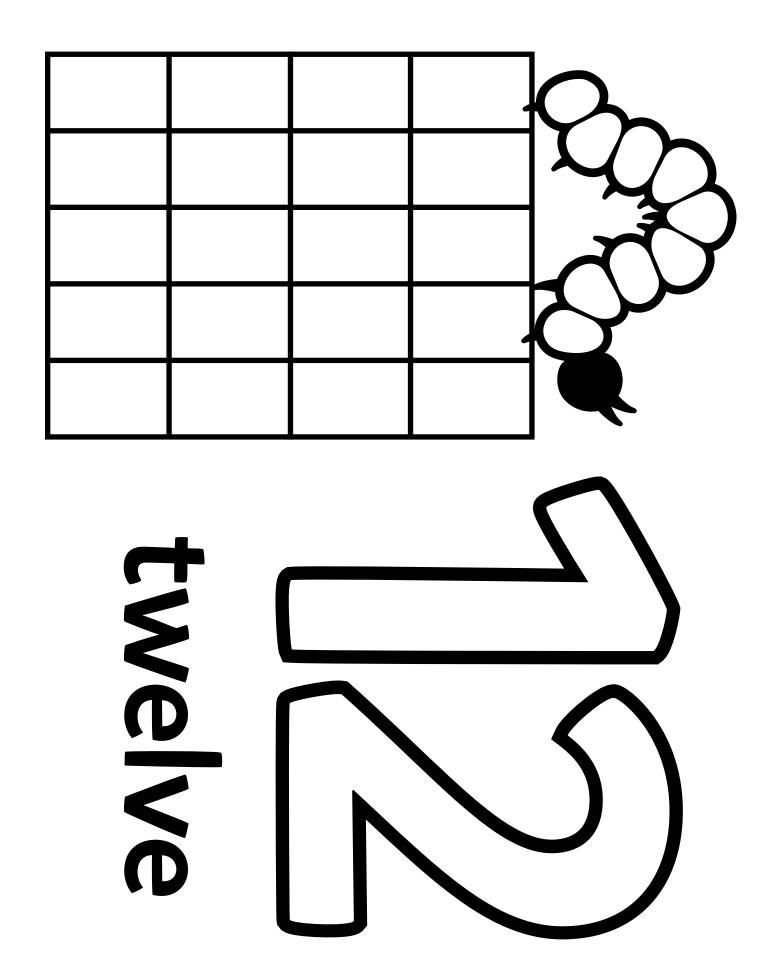


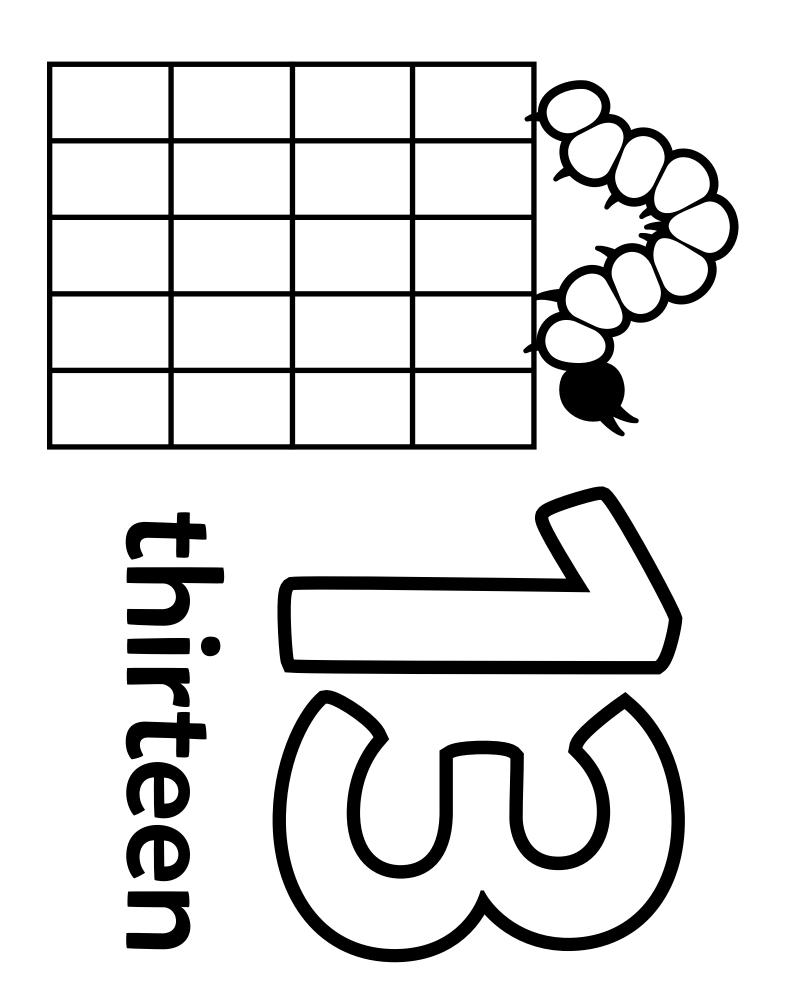


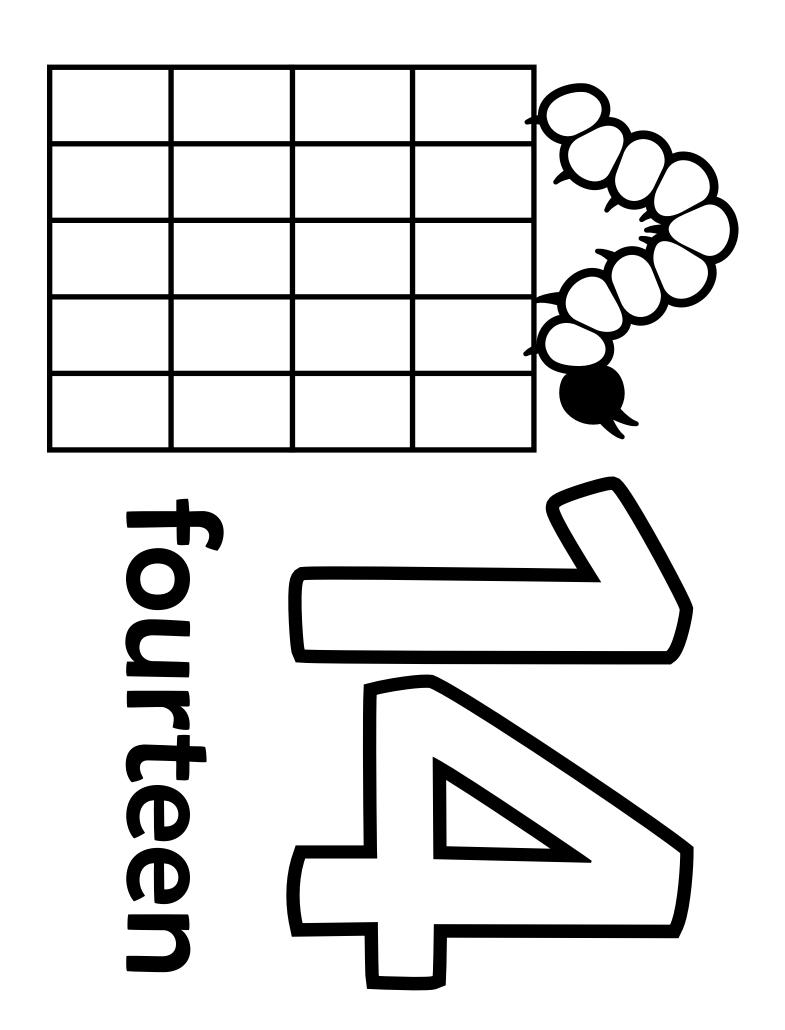


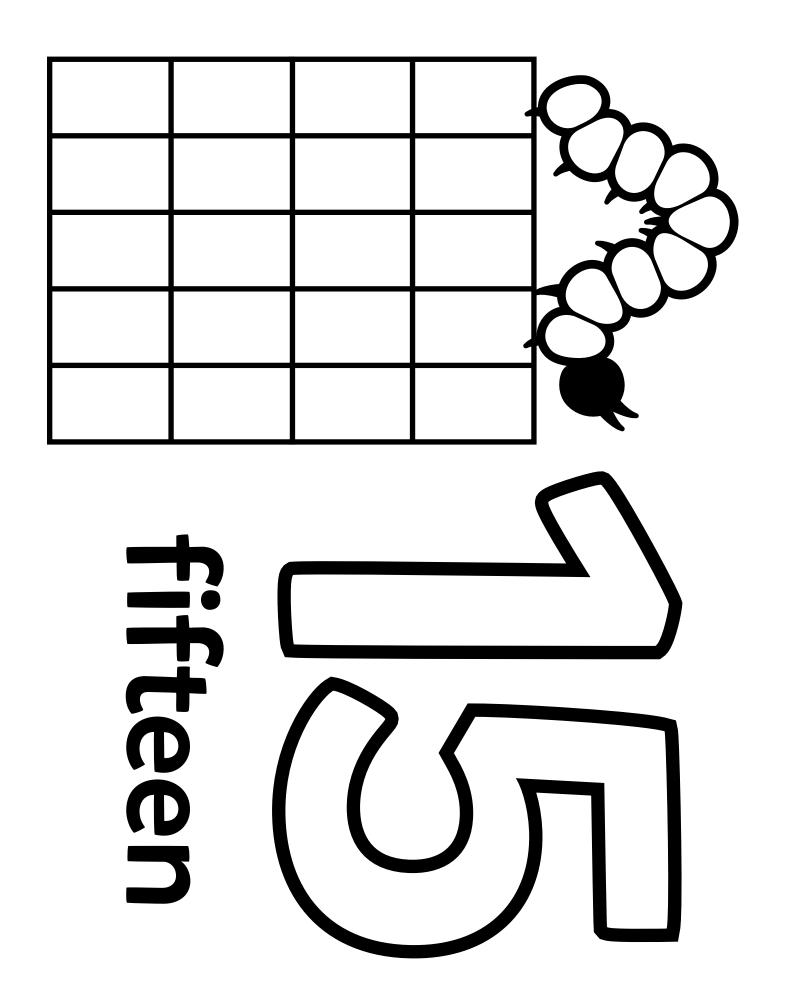


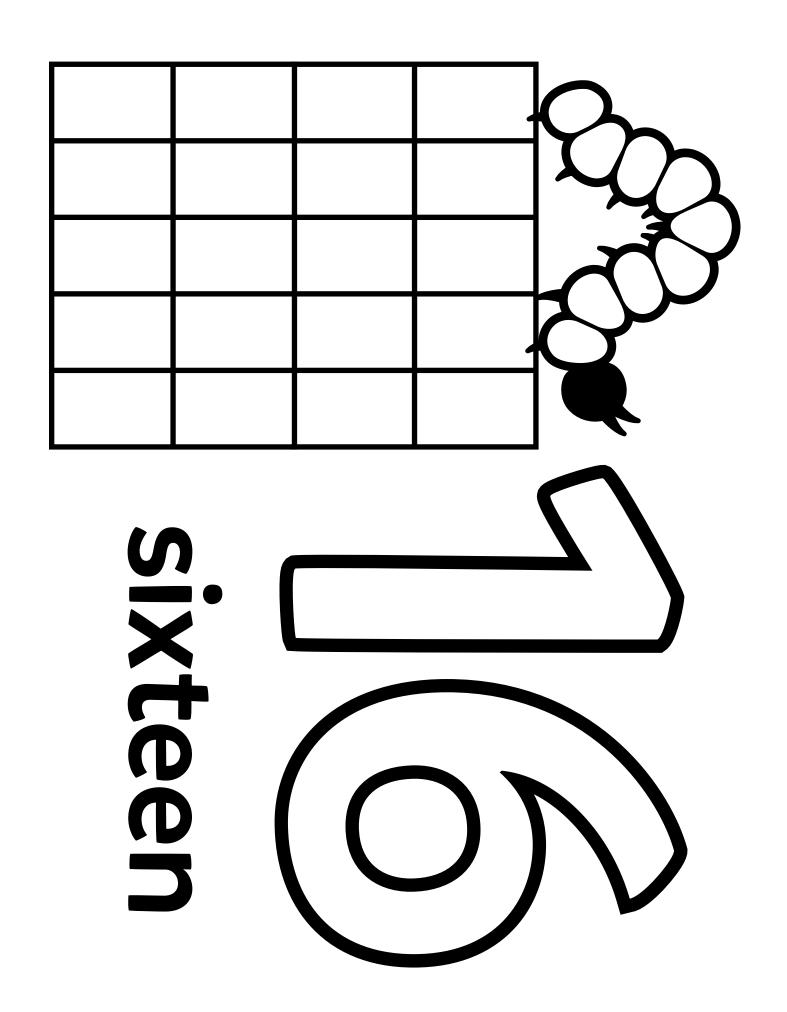


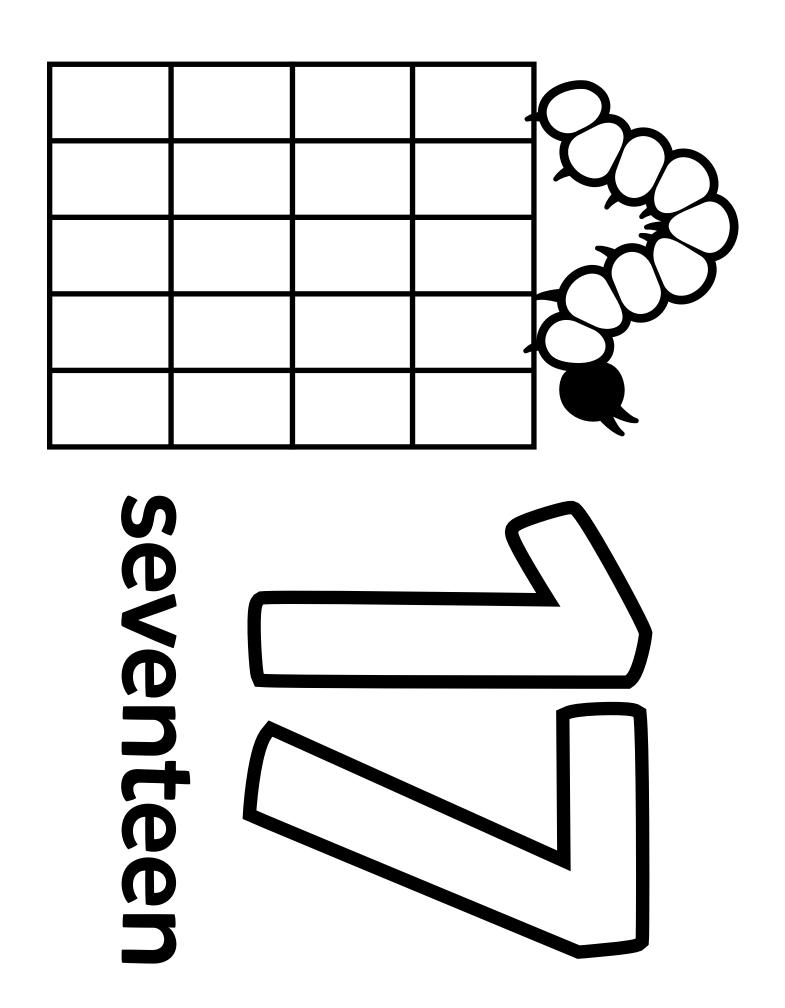


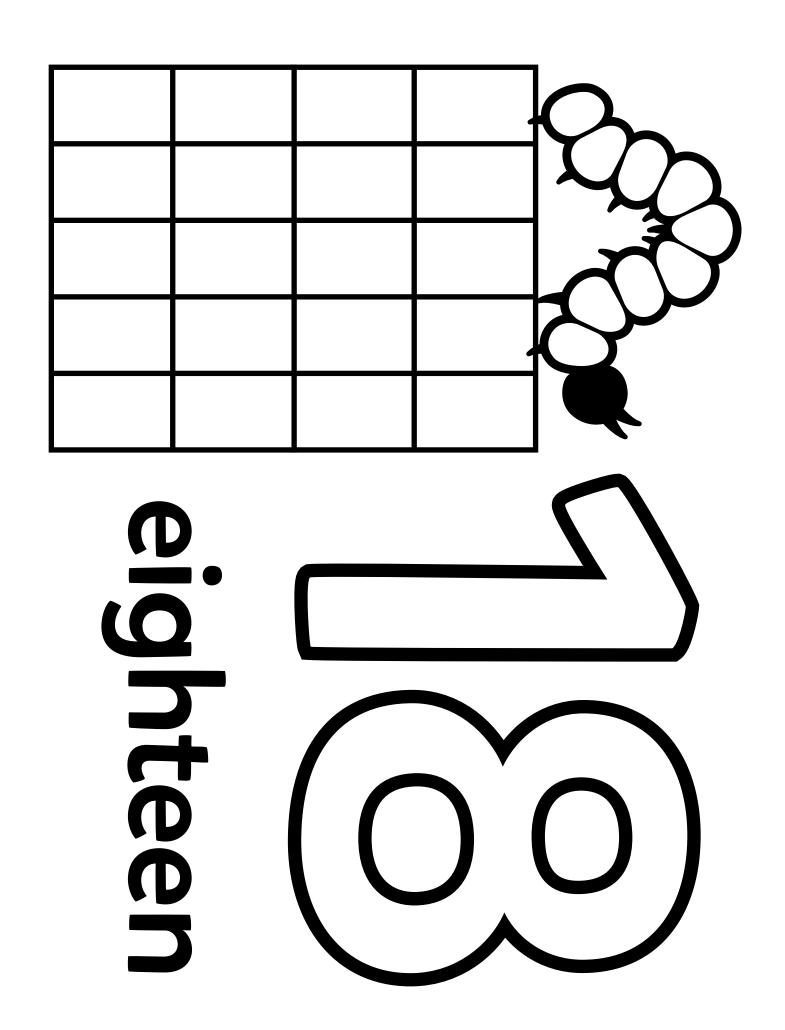


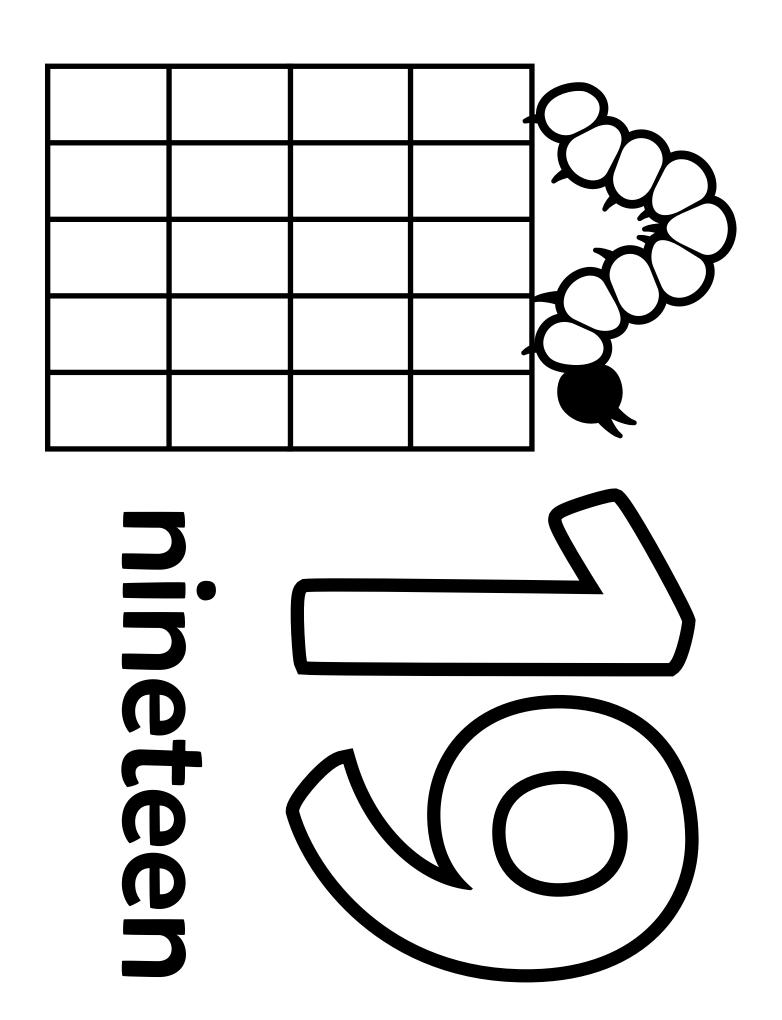


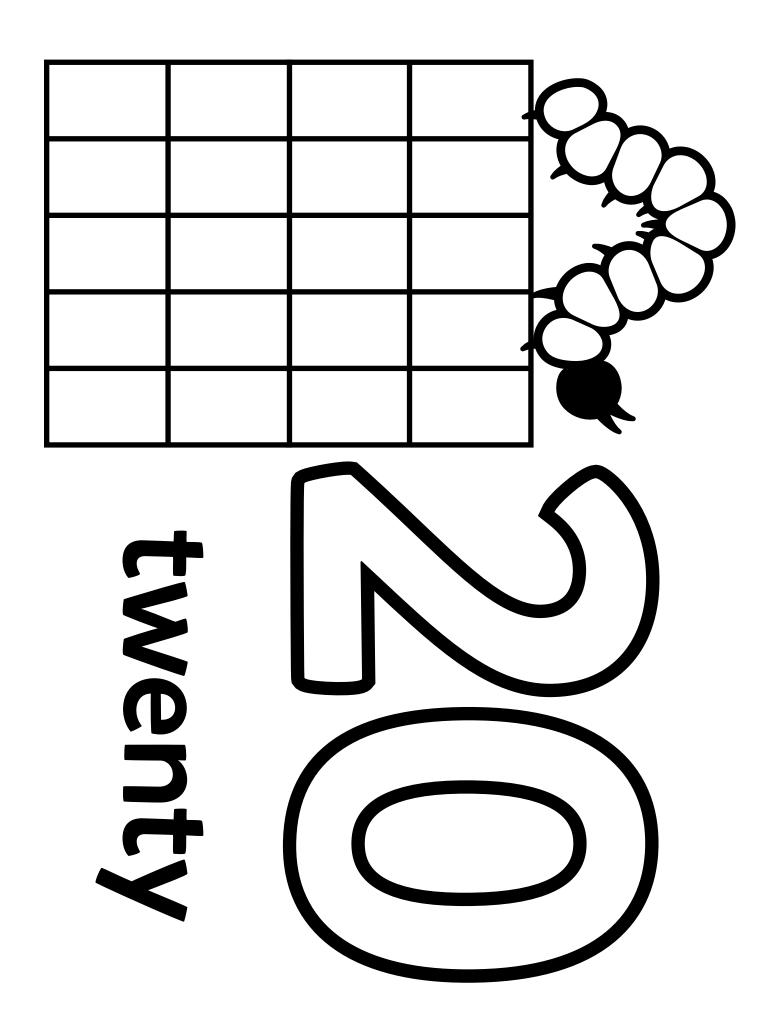








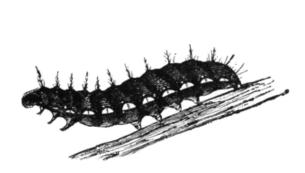




Is It a Caterpillar Or Not a Caterpillar?

Circle the the things that are caterpillars.

Mark an X through the things that are not caterpillars.













What Is a Butterfly?

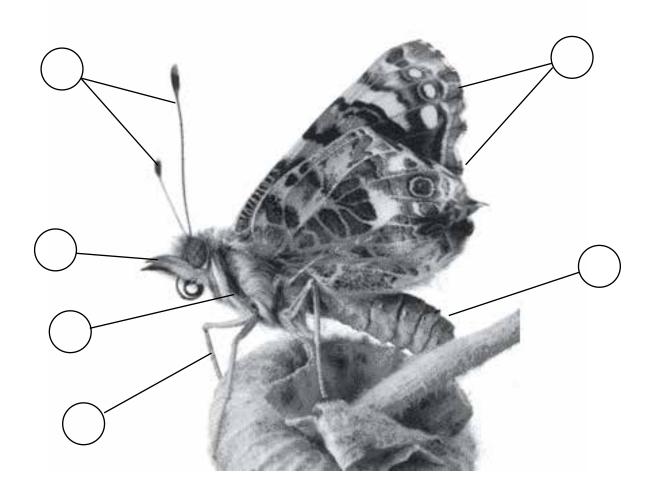
Name	 	
Date		

Can you match the words below 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



Is a Butterfly an Insect? Mini-Book



Print out the following page, one for each child.

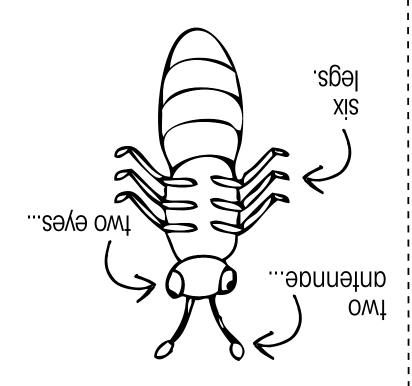
Have the students fold the page, following your demonstration.

First, fold the page in half, bringing the top down to the bottom with the images showing on the outside.

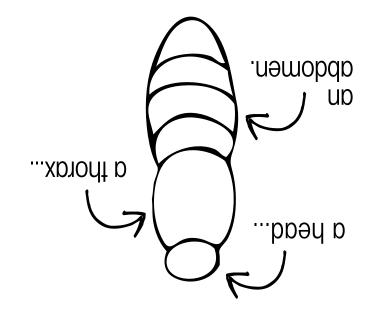
Next, fold it in half again.

The front cover of the mini-book says, "Is a Butterfly an Insect?"

The children can use crayons/markers to color the pictures.



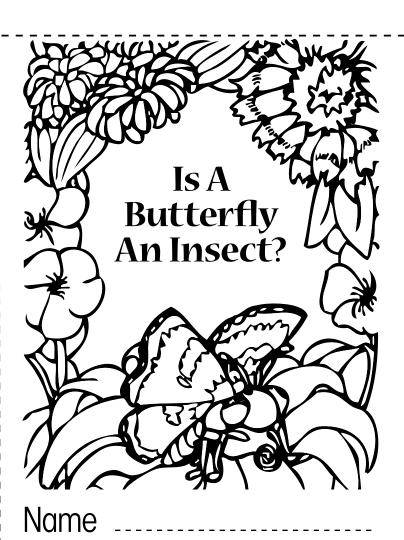
An insect also has...



An insect body has three parts…



A Butterfly IS An Insect!



Fingerprint Butterfly Art



Materials

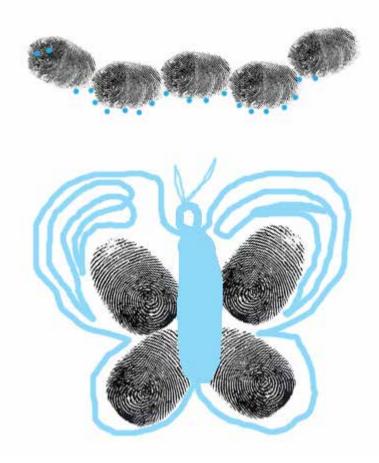
- Materials:
- Ink pads (non-toxic) or tempera paints
- Crayons and Markers
- White construction paper cut in half

Press your thumb into an ink pad and then onto the center of a practice paper. Practice pushing a thumb straight down and then lift it straight up so the thumbprint doesn't smudge.

Decide what butterfly life cycle stage to create.

How many thumbprints will you need?

Draw details like legs, antennae or eyes with a fine-tipped marker or a crayon.



Post Assessment



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

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!