Life Cycles Unit Teacher Masters: Table of Contents

Introductory Letter to Parents

Teacher Masters

Family Links

2012 Edition

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Dear Families,

Our class is beginning the Science Companion® Life Cycles Unit. The Life Cycles Unit builds on children's natural curiosity about life's diversity by selecting four organisms to study closely. Such an in-depth approach allows children to witness the remarkable growth and change living organisms experience during their life spans. Over the course of this study, patterns will emerge. Children will discover that birth, survival needs, growth and development, reproduction, and aging and death are the basic elements of a life cycle. They will also discover that within this general framework considerable variety exists.

The year begins with an examination of two familiar and relevant species: humans and trees. The children consider the life stages and life span of humans before embarking on a yearlong study monitoring growth and change in both themselves and a class tree. This extended period of study allows them to perceive the subtle changes which occur in organisms with relatively long life spans, in contrast to the dramatic changes they will observe when they study the relatively short life cycles of butterflies and pea plants during the second half of the year.

Throughout this unit, the class observes and monitors growth and change, documents details, and reports to others about the things they find along the way. By the end of the year, the children see the familiar in a new and fascinating light.

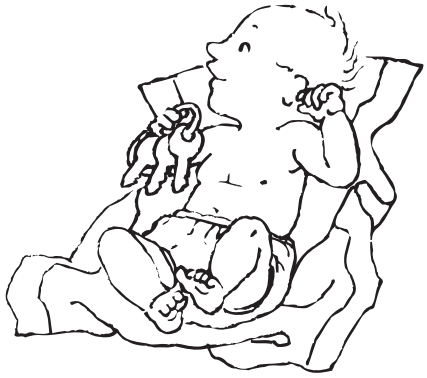
In addition to the work your child does in class, you and your child can explore this rich topic together at home in the following ways:

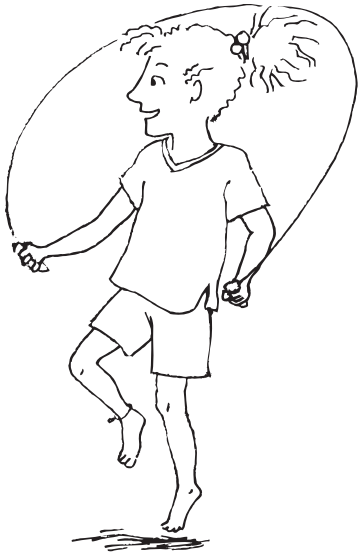
- Visit the library and search for books about life cycles to read together and share with the class. There are book suggestions on the Science Companion web site. This web site also features a list of other recommended web sites about life cycles. The address is: **www.sciencecompanion.com**
- Work together on the Family Link activities sent home from time to time. Your child may also want to repeat and vary some of the activities we do in class, as well as explain what they discover and learn, so please encourage their independent experimentation at home.

Throughout the school year, your child will discover that life cycles can be observed throughout nature; the unit's concepts provide a connection to the natural world that children experience every day. Hopefully, you will share some of your child's enthusiasm, thereby learning with them while helping them explore.

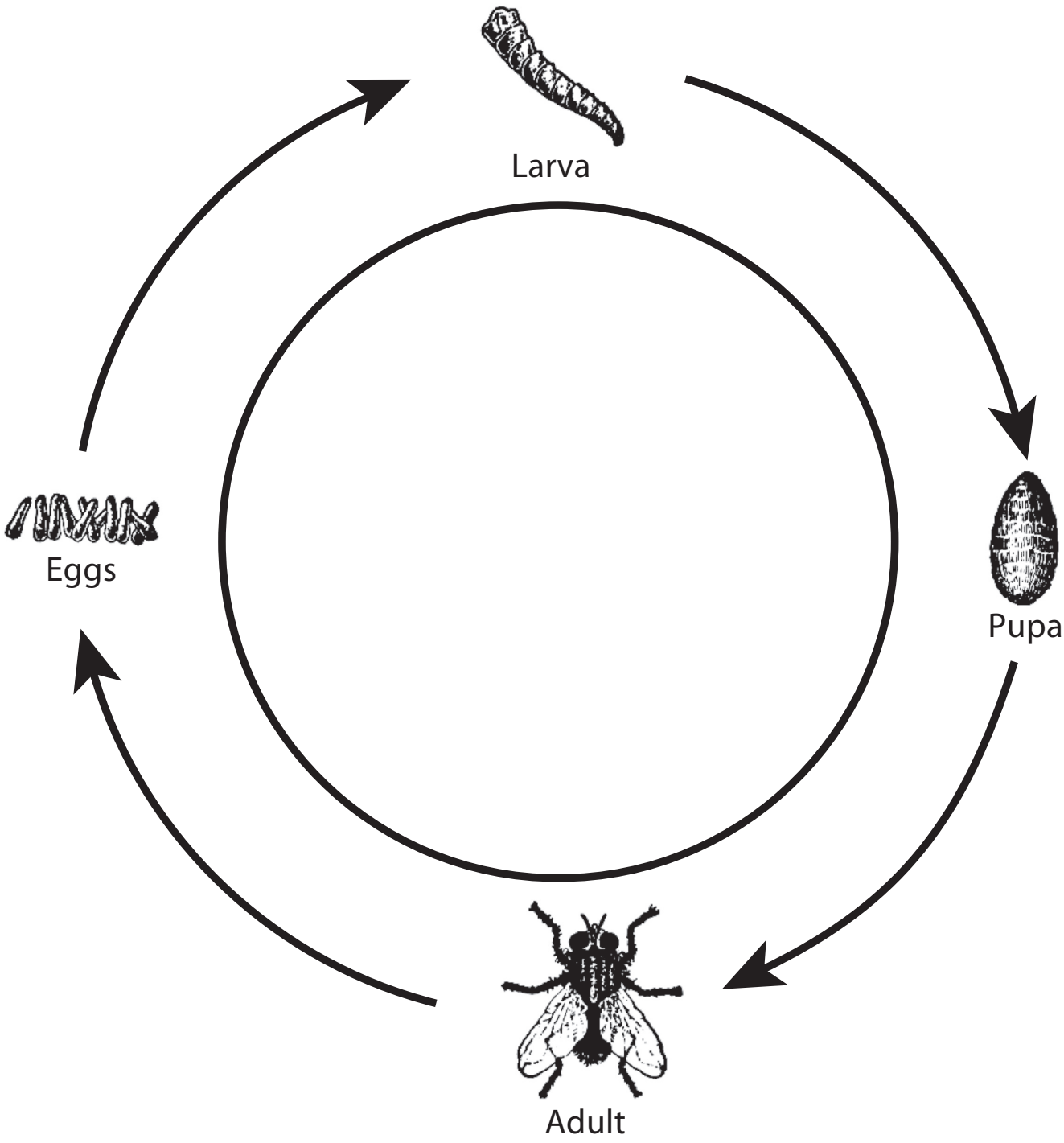
Sincerely,

Human Life Cycle Stages

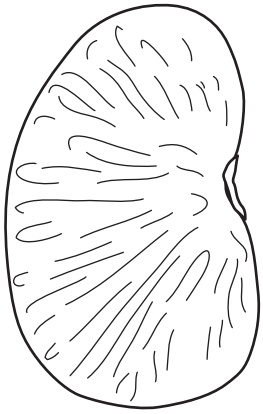


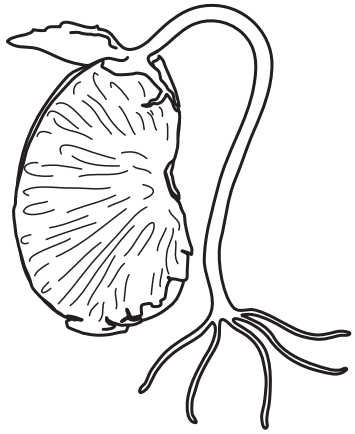


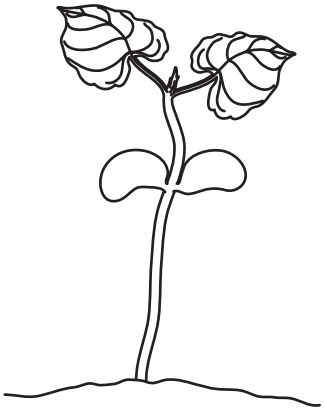
Housefly Life Cycle Diagram



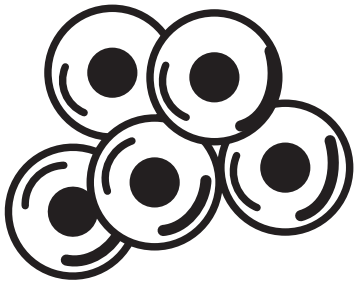
Bean Life Cycle Stages

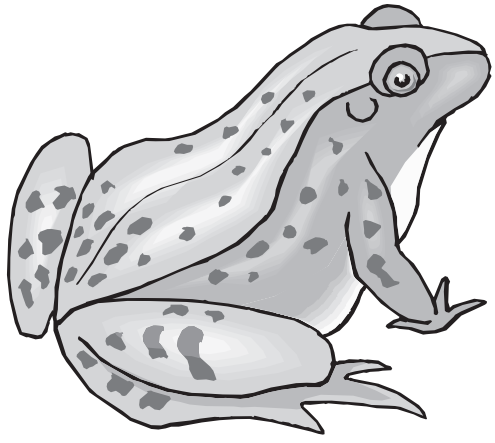




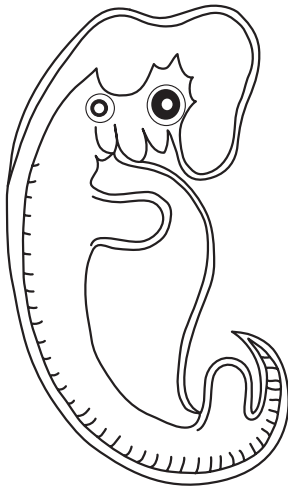


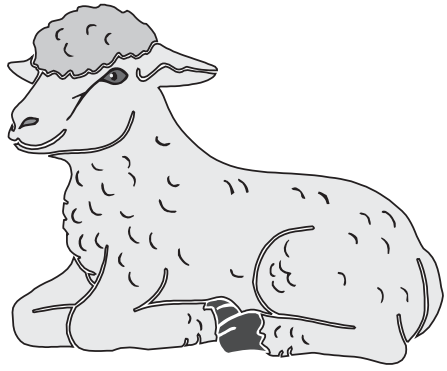
Frog Life Cycle Stages

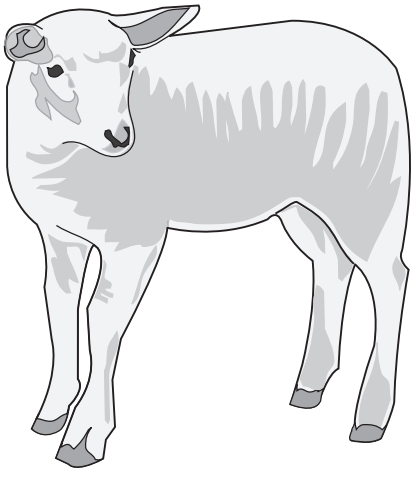


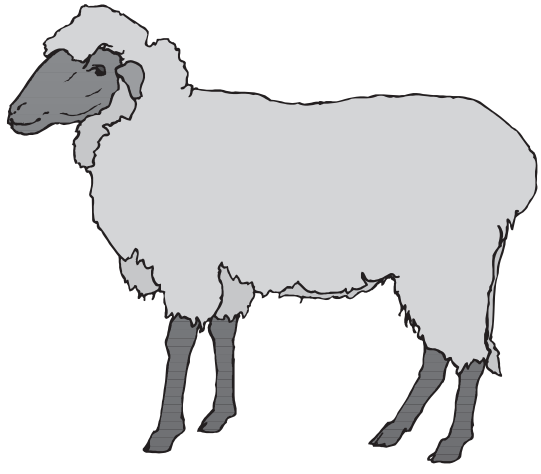


Sheep Life Cycle Stages









Pictures from a Family Photo Album

Grandmother at age 2.

Grandmother as a baby

Mommy as a baby.

Mommy at age 2.

Grandmother at age 8.

Grandmother

Baby Alice

Mommy at age 8.

Grandmother at age 16.

Grandmother as a mother-to-be.

Mommy as a mother-to-be.

Mommy at age 16.

Class Tree Observations—Fall

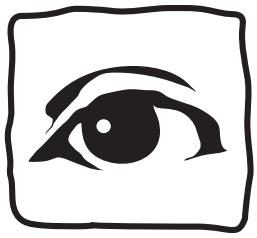
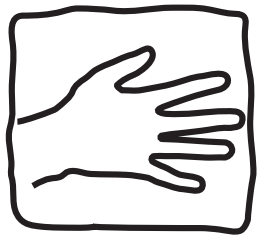
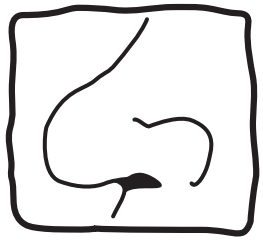
Tree and Branches

Leaves

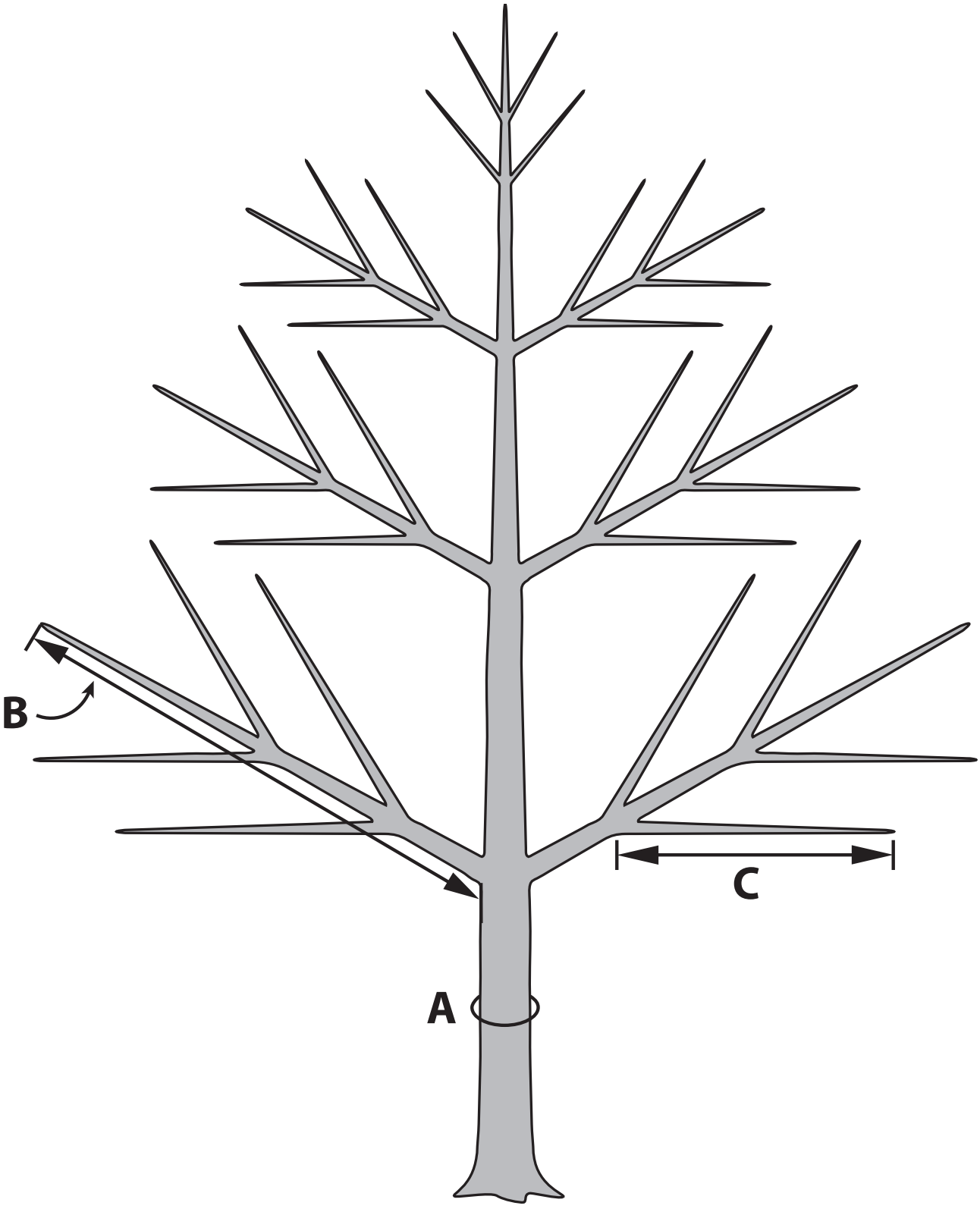
Surroundings

Descriptive Vocabulary

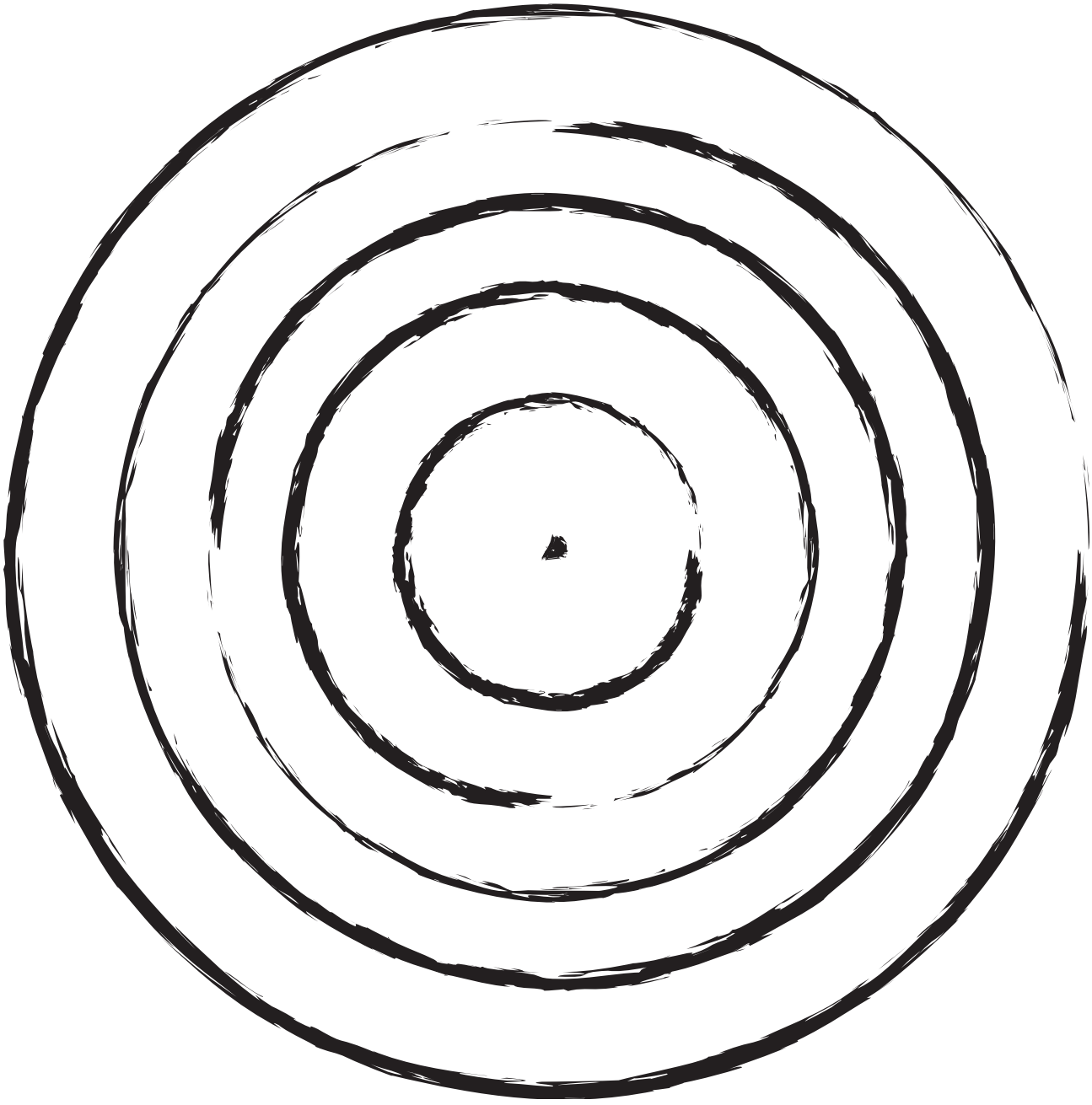
Sample words children might use to describe the tree:

Sense	Descriptive Words
Sight 	**The tree looks:** large, small, round, thick, thin, tall, green, brown, soft, spongy, shiny, dull, beautiful, ugly, old, strong, dead, leafy, bare **The tree looks like:** a mushroom, an umbrella, a dome
Hearing 	**Sounds the tree makes:** crackling, swooshing, rustling, no sounds (silence) **Sounds around the tree:** birds singing, crickets chirping, mosquitoes buzzing, branches falling
Touch 	**The bark feels:** rough, bumpy, smooth, sharp, sticky, hard **The leaves feel:** soft, waxy, rough, fleshy, brittle, smooth, wet, dry, sticky
Smell 	**The tree smells:** sweet, pretty, gross, musty **The tree smells like:** dirt, flowers, mold, grass

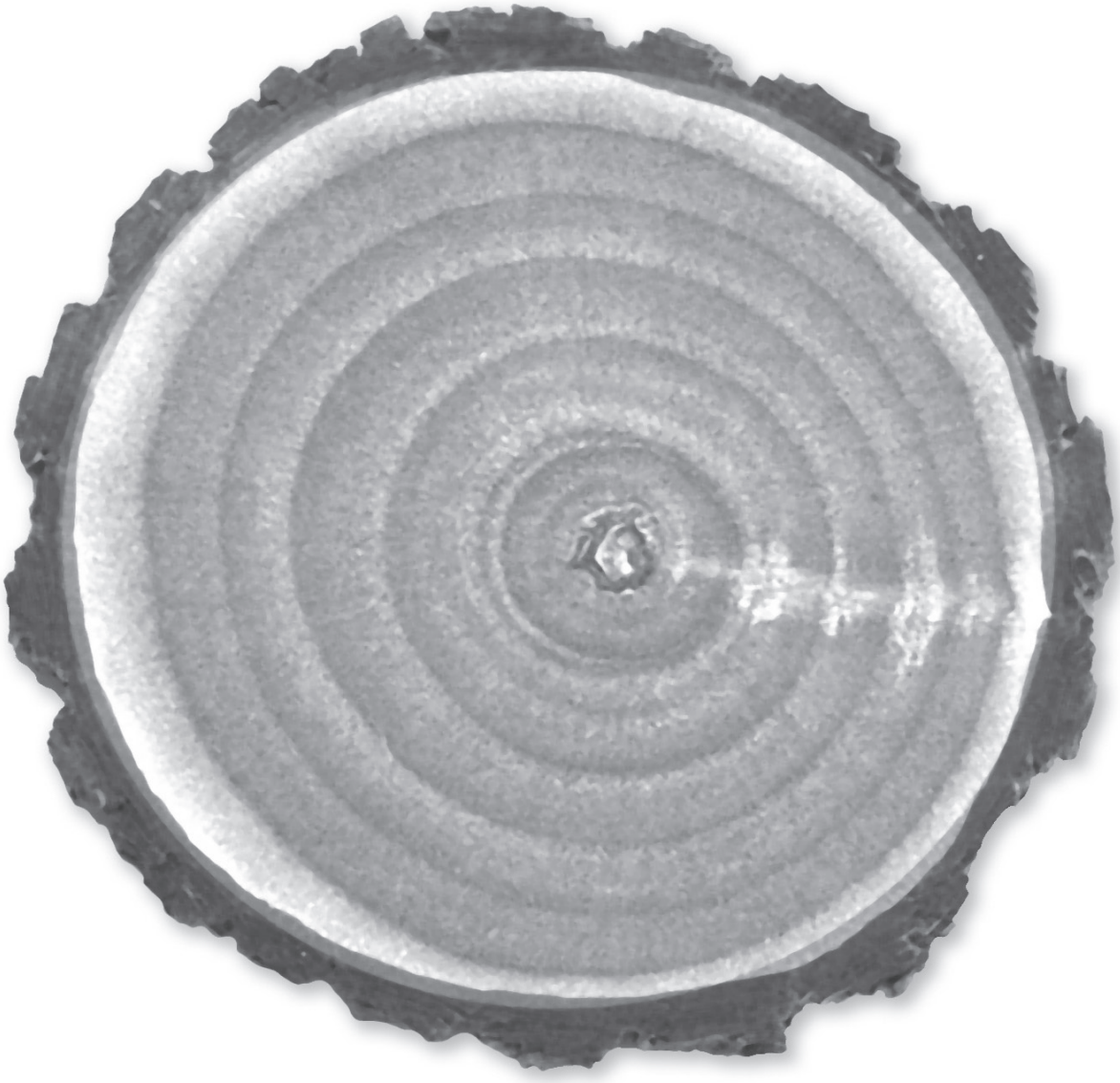
Tree Diagram



Counting Tree Rings



Tree Growth Rings



Class Tree Observations—Winter

Tree and Branches

Leaves

Surroundings

Butterfly Calendar

Week _____

Su	Monday	Tuesday	Wednesday	Thursday	Friday	Sa

Week _____

Su	Monday	Tuesday	Wednesday	Thursday	Friday	Sa

Week _____

Su	Monday	Tuesday	Wednesday	Thursday	Friday	Sa

Week _____

Su	Monday	Tuesday	Wednesday	Thursday	Friday	Sa

Butterfly Calendar

Week _____

Su	Monday	Tuesday	Wednesday	Thursday	Friday	Sa

Week _____

Su	Monday	Tuesday	Wednesday	Thursday	Friday	Sa

Week _____

Su	Monday	Tuesday	Wednesday	Thursday	Friday	Sa

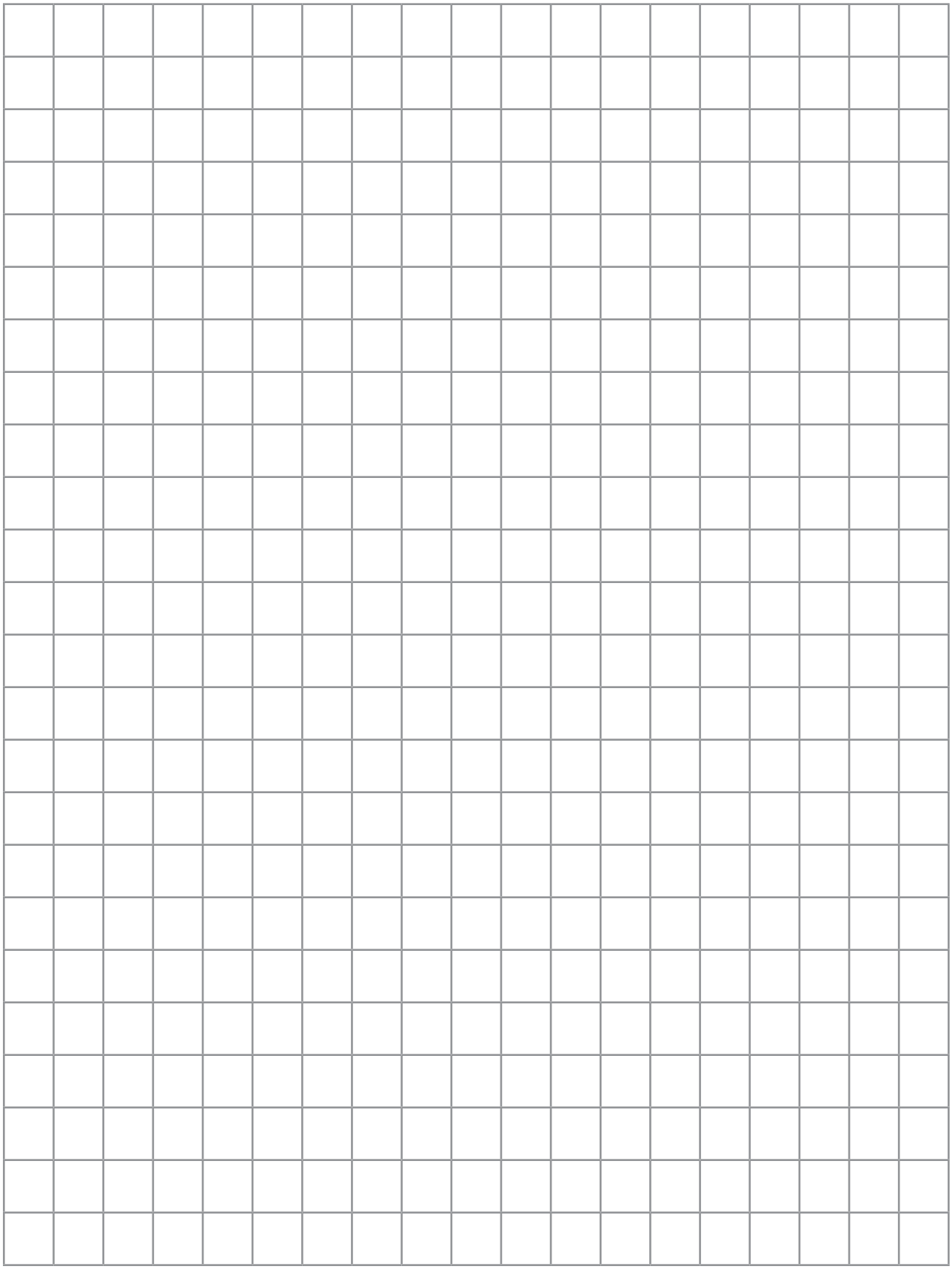
Week _____

Su	Monday	Tuesday	Wednesday	Thursday	Friday	Sa

Butterfly Life Cycle Events

Stage	Length	What happens	Kid-friendly wording / analogies / comparisons
Larva (Caterpillar)	Twelve to eighteen days. (When they arrive in your classroom, they are usually between three and six days old.) Note: the length of each stage varies depending on temperature. The insects develop more slowly in cooler weather, more quickly when it is warm.	Grows fast, eats a lot, produces a lot of bodily waste, and sheds its skin (molts) five times to accommodate its new size. Movement slows as it prepares to pupate. Attaches tail to top of vial, forms a J-shape, builds chrysalis.	Kind of like a baby: eats, sleeps, and produces lots of bodily waste. Unlike a baby, it grows very fast, shedding its skin when it grows too big.
Pupa (Chrysalis)	Seven to ten days.	Inside the hard covering, chemicals break down materials into a mush, like an oyster stew. Discs of cells carry the DNA instructions that direct cells to come together to make an adult butterfly. Look for movement in the chrysalis before emergence.	Within its protective coat, the caterpillar takes itself apart and reassembles its pieces into a butterfly.
Butterfly	Lives for two to three weeks. Mates on second or third day after it emerges.	Emerges from chrysalis rapidly; is immobile while pumping up wings with blood. Flies around, eats "nectar," mates, lays eggs, and dies.	The adult butterfly likes to fly and eat. The adult's most important activities are mating and, for females, laying eggs so that the next generation can be born and the cycle continued.
Egg	Three to five days. One butterfly lays about 500 eggs.	Bluish egg sits on its own for several days and hatches into a very tiny caterpillar.	Like a chicken egg, it needs to be kept warm in order to hatch.

Caterpillar Measurement Sheet



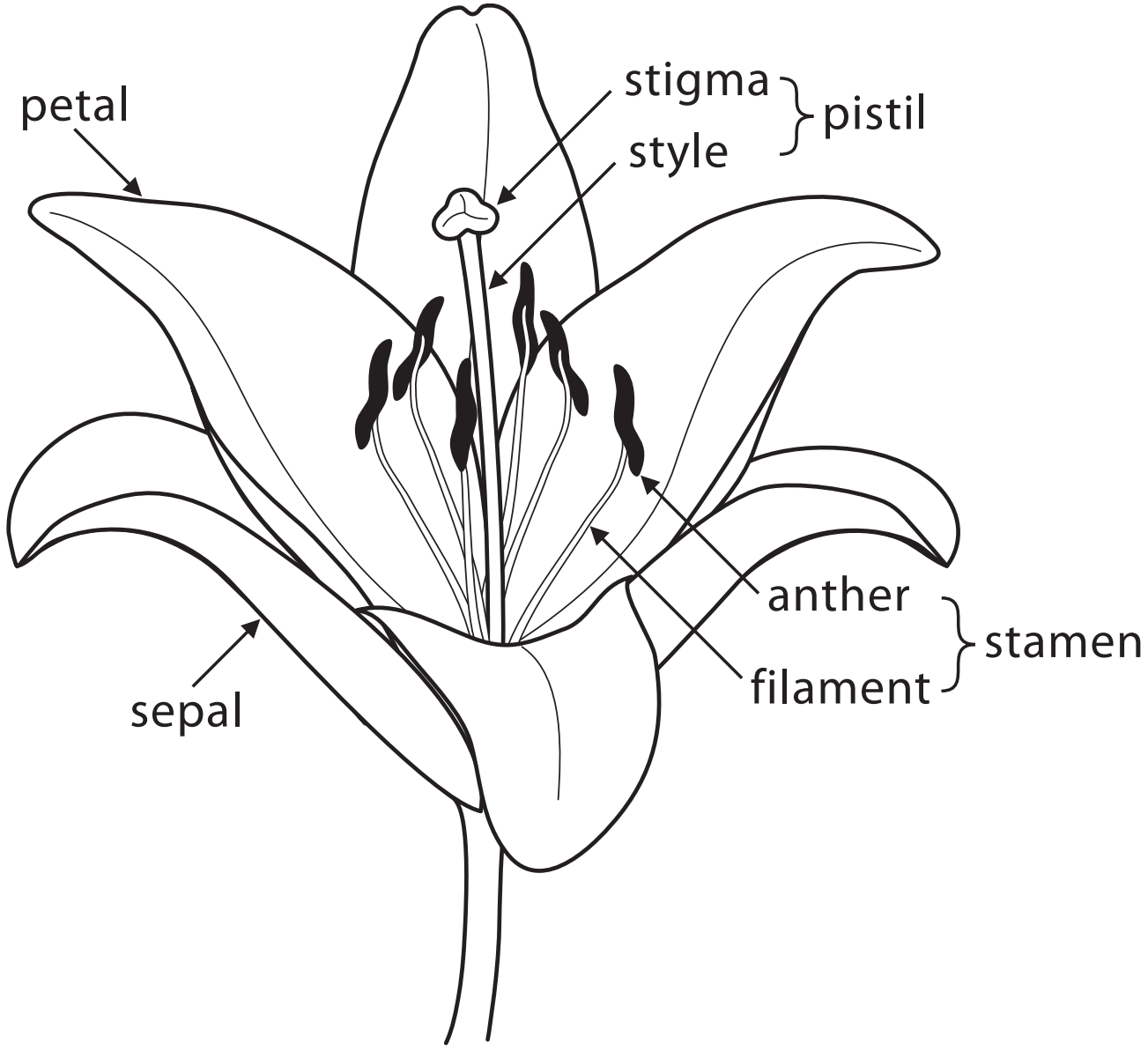
Class Tree Observations—Spring

Tree and Branches

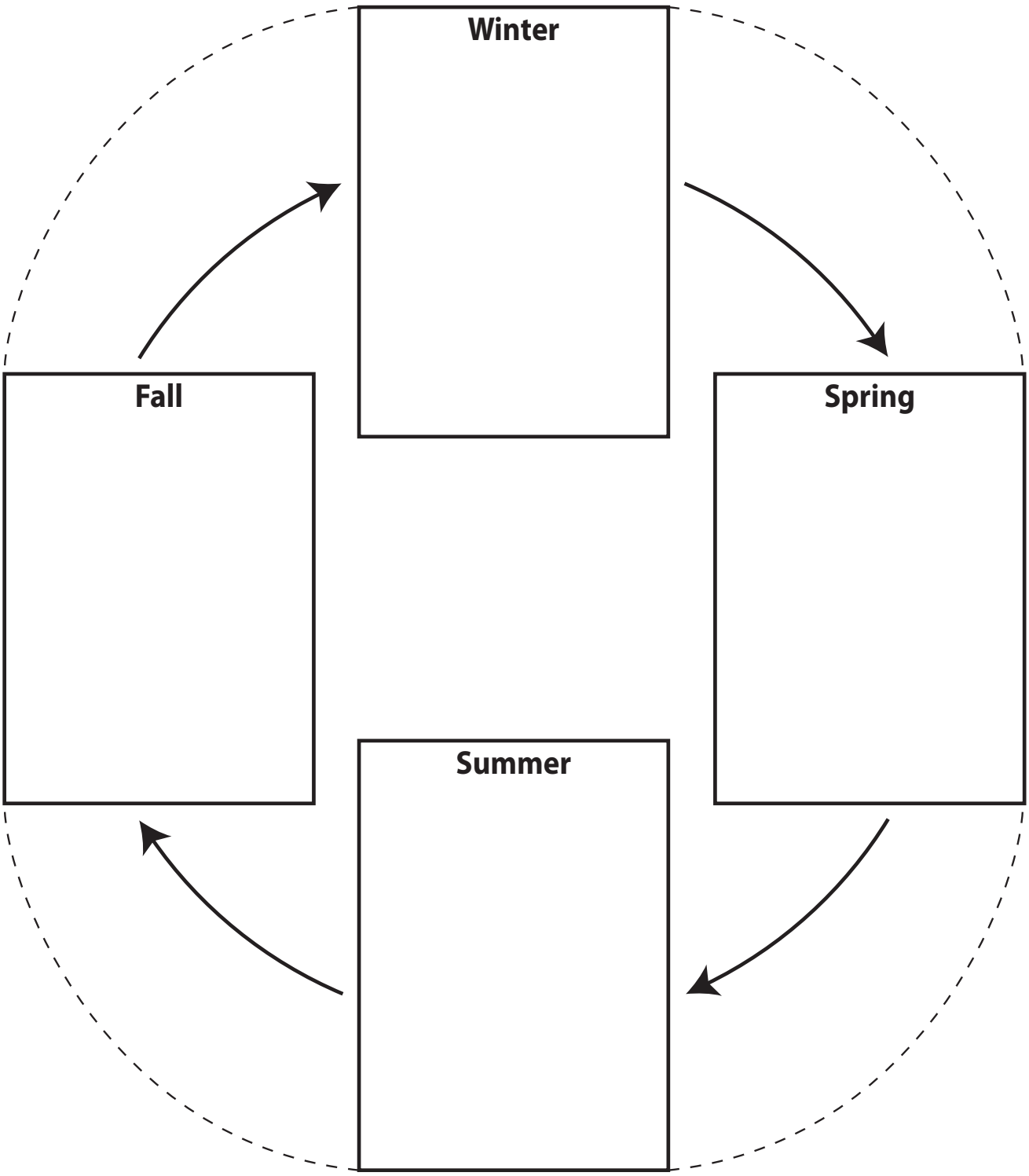
Leaves

Surroundings

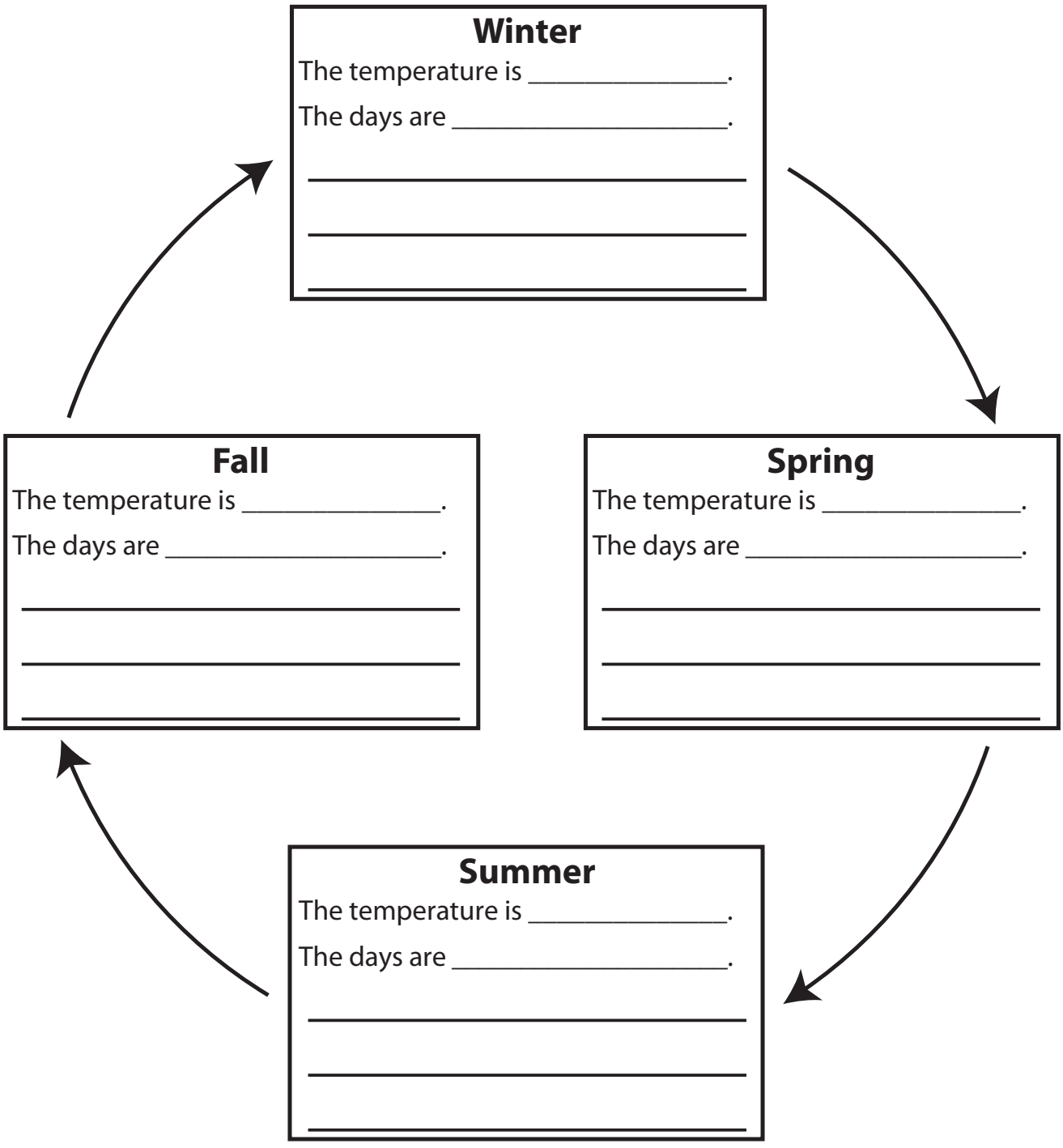
Flower Parts



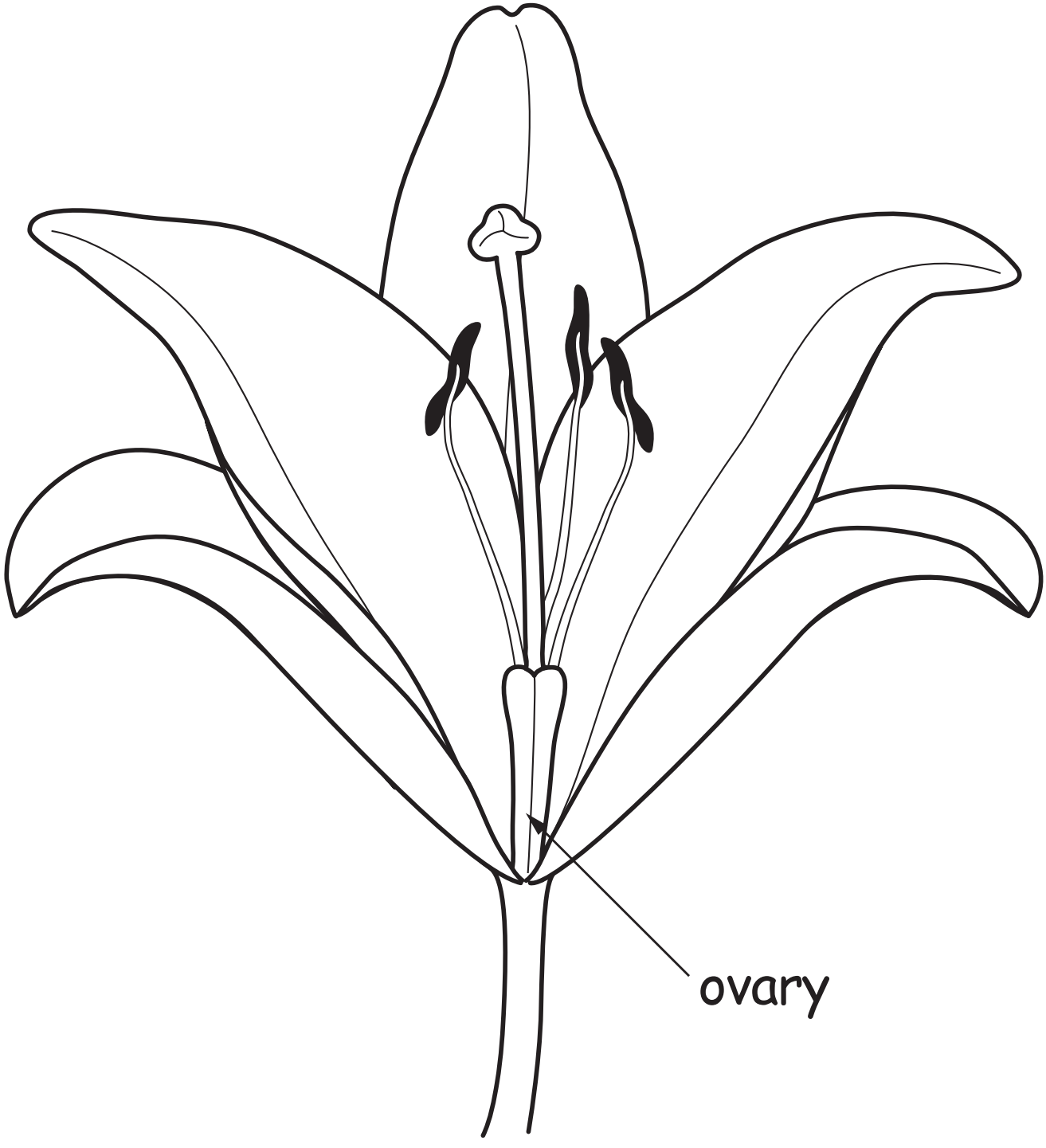
Annual Cycle of a Deciduous Tree



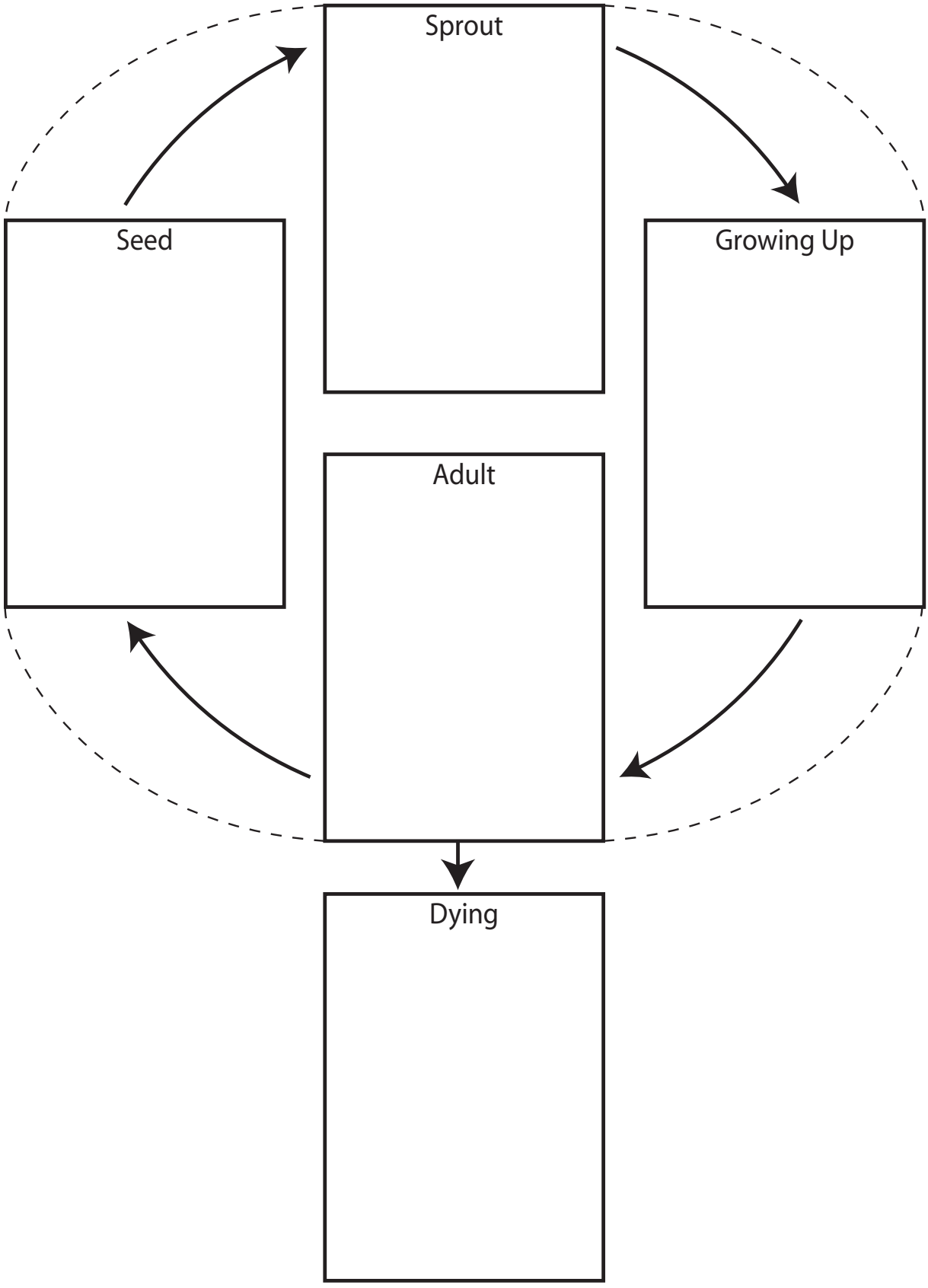
Seasonal Changes in the Class Tree



Location of Ovary



Pea Plant Life Cycle



Who Am I?

A Life Cycles Guessing Game

Created and Illustrated by

Who Am I?

I can live to be as old as _____.

I need these things to grow:

_____

_____

Here are some of the ways that I grow and change over a lifetime:

_____

_____

_____

_____

_____

_____

Here are some interesting facts about me:

_____

_____

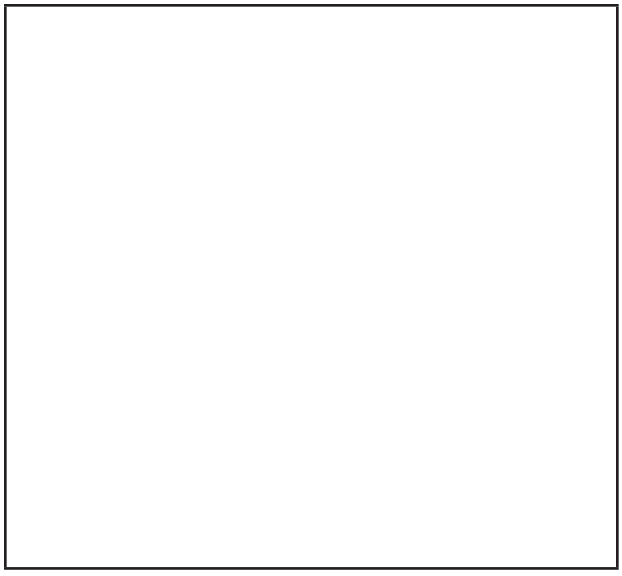
_____

To find out more about who I am, turn to the next page.

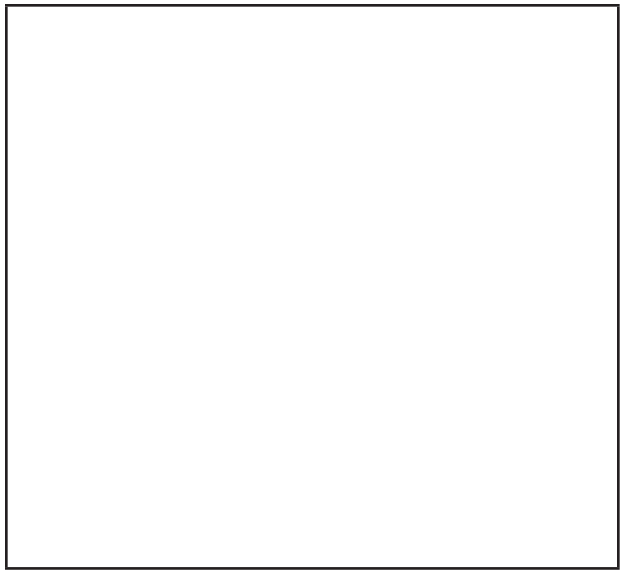
Answer Sheet

I am a _____.

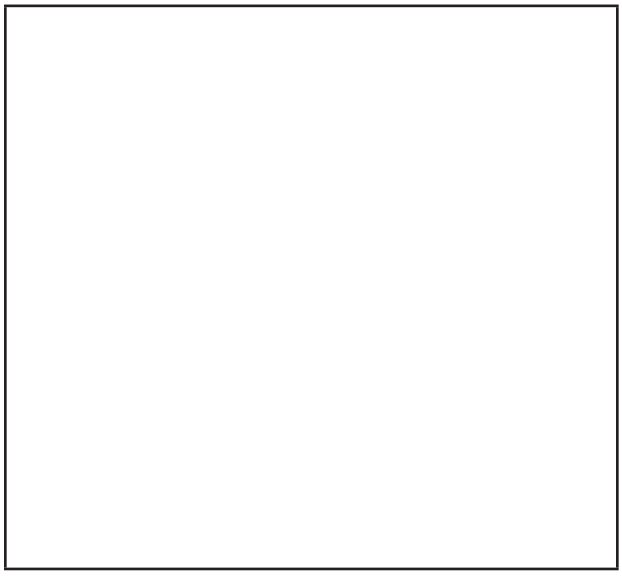
Here are four pictures that show how I grow and change over a lifetime.



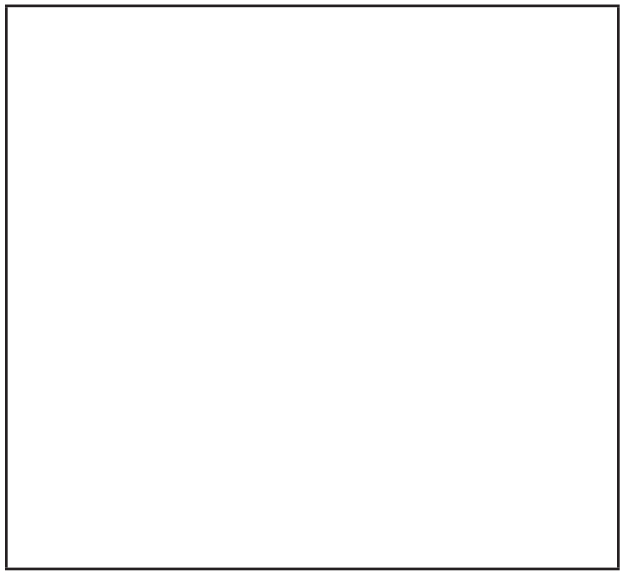
_____
(Name of Stage)



_____
(Name of Stage)



_____
(Name of Stage)

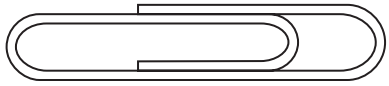


_____
(Name of Stage)

Measuring Length and Circumference

I measured:

a paperclip:



length: _____ cm

any object:

_____

length: _____ cm

a round object or cylinder:

_____

circumference: _____ cm

a round object or cylinder:

_____

circumference: _____ cm

Name: _____ **Date:** _____

Family Link with Science

Preparing Interview Questions

Our science class is studying human life stages and generations. In our next class the children will be interviewing guests who were children one and two generations ago. To make sure that the interview is a success, we have asked the children to prepare interview questions in advance.

Please guide your child as he or she develops and records two interview questions for our upcoming guests. Discuss the following characteristics of a good question with them and allow them to test their questions out on you:

1. Keep to the point of the interview, which is *to find out about what it was like to be a child one and two generations ago.*
2. Ask questions that will give you a clearer "picture" of a child's life in your parents' and grandparents' time. Try to imagine being a child that long ago. What things are hard for you to imagine?
3. Avoid questions that can be answered with a "yes" or "no" response.
4. Ask yourself, "Is this question likely to get an interesting answer?" Try it out on your parents and judge for yourself.

First Question:

Second Question:

Name: _____ **Date:** _____

Family Link with Science

Family Photos

In science class we are continuing our study of human life cycles and generations. You can reinforce the concept that human life stages repeat themselves from one generation to the next by showing your child photographs of yourself (or another family member) as a baby, toddler, child, teenager, and adult.

If possible, find a picture of yourself when you were your child's age. Encourage your child to look for similarities between your picture as a child and your appearance now.

Have your child choose their favorite photograph of you and describe it below.

1. My favorite photograph is of my _____ .
   (name of family member)

2. Why do you like it?

Name: _____ **Date:** _____

Family Link with Science

Tree Inventory

Throughout the school year our class will be studying a tree and examining how it grows and changes.

To increase awareness of the number and variety of trees around us, please help your child conduct a survey of the trees in your yard or on your street.

1. Describe the area (yard, street, park, etc.) you studied.

2. Organize similar trees into groups. The trees don't need to be exactly the same and you can create your own names for the groups. For each group, list the number of trees and the characteristics the trees have in common. (See the example below.)

Group Name	Number of Trees	Common Characteristics
Pointy Needle Group	5	Long and pointy needles, large cones, rough bark

Name: _____ **Date:** _____

Family Link with Science

Tree Inventory

Group Name	Number of Trees	Common Characteristics

Name: _____ **Date:** _____

Family Link with Science

Household Items

Our class is studying trees in science.

Ask your child to identify and list at least 10 household items that are made from trees.

Name: _____ **Date:** _____

Family Link with Science

Tree Cross Section Request

In January our class will be examining tree growth rings.

Please consider sending some tree cross sections to school with your child.

The cross sections can be made by cutting off a 7-10 cm (3-4 in) diameter section from any tree that has already been cut down.

Clean and smooth cuts are best. Good sources would include:

- Dry, unsplit firewood
- A cutting from the bottom of a holiday tree

Name: _____ **Date:** _____

Family Link with Science

Using Arm Span to Estimate Height

Today the children learned that the measurement of their arm spans is almost the same as their height. To test the accuracy of this method, each child in the class has been asked to measure the arm span and height of one family member.

If you have a measuring tape at home, please allow your child to measure your arm span and height. We will examine the data in our next science class to determine how reliable this method of estimation is. Encourage your child to work independently and to record the results below. Make sure your child records the unit of measurement as well.

I measured my _____.
(family member)

I found that they have:

an arm span of _____.

a height of _____.

Name: _____ **Date:** _____

Family Link with Science

Practicing and Learning

In science class today we discussed how the connections formed in the brain are strengthened when they are used over and over again. Learning a skill requires not only that new connections be made, but that these connections be strengthened over time. This is known as "practicing."

Please help your child select a skill to practice over the course of the school year (for example, yo-yos, shooting baskets, jumping rope, playing an instrument, card tricks, memorizing state capitals or the presidents of the United States). Have your child identify this chosen skill below and describe his or her present skill level in as much detail as possible. At the end of the year we will refer back to this description to see whether practice has promoted learning and improved your child's skill level.

1. The skill I plan to practice over the school year is:

2. My skill level at this time is:

Name: _____ **Date:** _____

Family Link with Science

Deciduous or Evergreen?

Earlier this year, after Life Cycles Lesson 5, "Trees: Meet Our Tree," you counted and grouped the trees in your yard or on your street. Revisit those trees to determine how many are deciduous and how many are evergreen.

Remember that:

Deciduous trees lose their leaves in the fall.

Evergreen trees keep their leaves all year.

1. How many deciduous trees are there? _____

2. How many evergreen trees are there? _____

3. What other differences do you notice between deciduous trees and evergreen trees?

Name: _____ **Date:** _____

Family Link with Science

Home Plant Tracking Sheet

Complete the following questions.

1. Type of seed planted: _____

2. Date planted: _____

3. Number of seeds planted: _____

4. Describe how you planted your seeds. You may use drawings.

Name: _____ **Date:** _____

Family Link with Science

Making Dinner

Teach your family about fruits while you help make dinner. List each item that goes into the meal. Next to the item, write whether it is a fruit or not.

Name: _____ **Date:** _____

Family Link with Science

Family Feedback: Life Cycles Guessing Game

Have one or more family members read the clues and review the answer sheets in your "Who Am I?" packet. After they have read the entire packet, ask them the following questions and record their responses:

1. Were you able to guess each organism based on its life span alone?

   _____

2. Were you able to guess each organism based on what that organism needs in order to grow? _____

3. Were you able to guess each organism based on how it grows and changes over a lifetime? _____

4. What information in the packet did you find most interesting?