



Math

# HEALTHY TREES: APPLE ADDITION

## Grade Level

4-6

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will better understand factors that influence tree health.

## Materials

- Poker chip set with at least 10 different colors ([this is the one we purchased](#) - if you have a different one, you may have to modify the colors on the worksheet)
- Student handouts

## Standards

### Common Core

CCSS.Math.Content.4.OA.1, 4.OA.2, 4.OA.3, 5.OA.1, 5.OA.2, 5.NBT.5, 6.EE.1

### NGSS

4-LS1-1, 5-LS1-1

## Lesson Summary

This lesson is designed to help students better understand the many factors necessary to grow healthy apple trees, all while practicing multiple step math equations.

## Suggested Sequence of Events:

1. Set Up: Print student handouts for each student.
2. Read through the [IAITC Apple Ag Mag](#) to learn more about apples. Interactive online versions can be found on our website. Additional books to pair with this lesson can be found on the Teacher Resources page.
3. Ask students to spread out in the classroom (or on the playground). They should stand with enough room to "spread their branches." Once they have evenly spread out, they are now apple trees and are "rooted" to the ground.
4. Randomly throw out the poker chips to scatter the floor around the students. Each student should be able to grab some chips, but do not worry about making it exactly even.
5. Following the order on the student worksheet, ask students to quickly pick up the poker chips of that color after you say "go." Students cannot move their feet (they are trees, after all) and must only gather what they reach from their position.
6. After each color has been collected, explain to students what that color represents and why it is important to consider for apple tree growers focused on the health of their apple tree. Use the "Tree Health Indicators" handout to assist with this. Some colors are beneficial to the tree, and others are harmful. It is important to not tell students ahead of time what each represents, so they will always attempt to gather as much as they can.
7. Once all colors have been collected, have students return to their seats to start counting their chips and completing the math equations on the Student Handouts. The students with the highest scores managed to grow into the healthiest trees in the orchard.
8. Discussion: Discuss with students why each of these factors is important to tree health. What can farmers and growers do to help their trees become as healthy and strong as possible?

# TEACHER RESOURCES

## Extension Ideas

- Learn more about each of the "Tree Health Indicators" from this lesson. Are these helpful and/or beneficial for other trees, flowers, and crops?
- Learn more about the life cycle of apple trees.
  - Show a labeled diagram of a blossom and of an apple.
  - Watch a time lapse video of an apple growing. How long does the actual process take?
- Take a field trip to a nearby apple orchard and learn more about apple farming. What do apple farmers do throughout the year to take care of their orchards?
  - Take a virtual field trip to Braeutigam Orchard in Belleville, Illinois, and learn more about apple farming. This video can be found on our [website](#).
- Have students write a story that takes place at an apple orchard.
- Learn about Controlled Atmospheric Storage and how apples are kept ripe after they are harvested.
- Scientific Inquiry: Have students complete our "Browning Apples" lesson and test variables to see what might slow the browning of apples once they have been sliced.
- Do all apples look and taste the same? Have students use their senses to compare different varieties of apples.
  - Have students research what apples are best used in different recipes.
  - Introduce genetics and selective breeding with apples and learn more about grafting and budding.
- Are apples native to the United States? Learn about the history of apples.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Ag Literacy Coordinator for free classroom sets of our Ag Mags!



# TREE HEALTH INDICATORS



## YELLOW - SUNLIGHT

Trees need sunlight for photosynthesis in order to create their own food for energy.

## GREEN - SOIL NUTRIENTS

Trees get vital nutrients from the soil through their roots. If the soil doesn't have many nutrients, farmers add fertilizer to the soil or to irrigation water.

## PINK - HARMFUL INSECTS

Apple trees have many harmful pests that can impact tree health throughout the entire growing season.

## ORANGE - POLLINATORS

Pollinators are vital for apple crops. Honeybees and other native IL pollinators help blossoms turn into apples for us to eat.

## WHITE - KILLING FROST

Many different plants are sensitive to temperature changes. On cold spring and summer nights, some growers spray their apple trees with water during cold spells to insulate sensitive blossoms.

## PURPLE - DISEASE

A combination of heat and humidity is the perfect environment for many microorganisms to grow, some of which cause plant diseases. Some microbes can live in the soil for many years.

## BLUE - WATER

Trees need substantial amounts of water, especially young trees, but most don't like their "feet wet".

## RED - EFFECTIVE PRUNING

Effective pruning of apple trees is essential for tree and fruit health. Apple trees need a leader branch and a lot of room between branches for airflow and sunlight.

## BLACK - PROPER THINNING

Apple trees must be properly thinned to allow fewer number of fruits to reach maturity. This helps the remaining fruit grow larger and protect the tree limbs from being too heavy.

## FUCHSIA - STAKING & TRELLISING

Young trees are not as strong as mature trees. Using a trellis or stake to hold it upright will help the young tree stay standing if it gets really windy outside.





Name: \_\_\_\_\_

# HEALTHY TREES: APPLE ADDITION

Just like all other plants, apple trees need certain things to be healthy! But there are also things that can be harmful to apple tree health. Each color chip represents something that is either beneficial (good) or harmful (bad) for the overall health of an apple tree. Complete the math equations below based on the number of chips you collected to see how healthy your tree is!

- Sort the color chips you collected into separate piles.
- Record (write) the number of chips collected on the first line of the equation in the box labeled with the same color.
- Complete the multiplication equation to find the total score for each color. Use the number line to represent all your leaps.

How many chips of that color you collected

**WHITE = KILLING FROST**  
Harmful, lose triple points!  

\_\_\_\_\_

x

-3

=

\_\_\_\_\_

Total for the color

The negative symbol (-) means to leap to the **left** that many times for each color chip.

\_\_\_\_\_

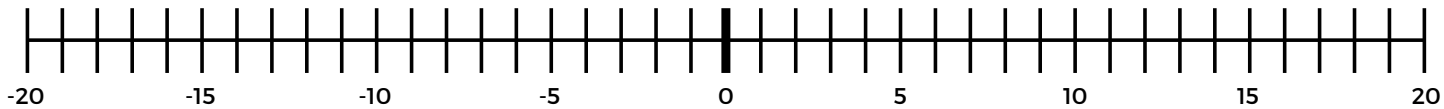
x

2

=

\_\_\_\_\_

**YELLOW = SUNLIGHT**  
Beneficial, earn double points!  
No negative symbol means to leap to the **right** that many times for each color chip.



\_\_\_\_\_

x

-2

=

\_\_\_\_\_

**PURPLE = DISEASE**  
Harmful, lose double points!

\_\_\_\_\_

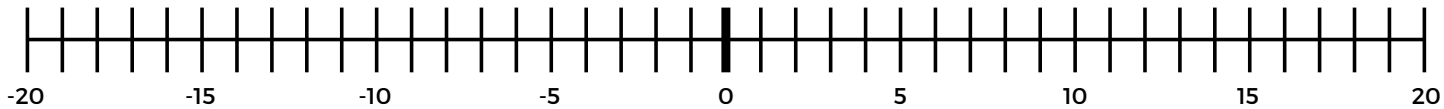
x

2

=

\_\_\_\_\_

**ORANGE = POLLINATORS**  
Beneficial, earn double points!



\_\_\_\_\_

x

-1

=

\_\_\_\_\_

**PINK = HARMFUL INSECTS**  
Harmful, lose one point for each chip collected!

\_\_\_\_\_

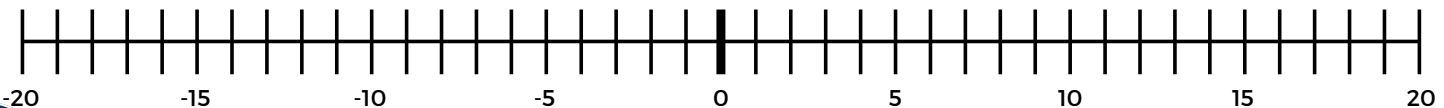
x

2

=

\_\_\_\_\_

**GREEN = SOIL NUTRIENTS**  
Beneficial, earn double points!







## BLUE = WATER

Beneficial but possibly harmful,  
complete the equation to find your  
final score.


Number of chips collected: \_\_\_\_\_

 \_\_\_\_\_ x 1 = \_\_\_\_\_  
The number of color chips collected

Is this number less than  
or equal to 5? If yes, this is  
your score for this color.



Is this number more than  
5? If yes, then subtract 2  
from your answer to find  
your final score.

 \_\_\_\_\_ - 2 = \_\_\_\_\_  
Your score from the first box

## RED = EFFECTIVE PRUNING

Beneficial but possibly harmful,  
complete the equation to find your  
final score.


Number of chips collected: \_\_\_\_\_

 \_\_\_\_\_ x 1 = \_\_\_\_\_  
The number of color chips collected

Is this number less than  
or equal to 5? If yes, this is  
your score for this color.



Is this number more than  
5? If yes, then subtract 3  
from your answer to find  
your final score.

 \_\_\_\_\_ - 3 = \_\_\_\_\_  
Your score from the first box

## BLACK = PROPER THINNING

Beneficial but possibly harmful,  
complete the equation to find your  
final score.


Number of chips collected: \_\_\_\_\_

 \_\_\_\_\_ x 1 = \_\_\_\_\_  
The number of color chips collected

Is this number less than  
or equal to 5? If yes, this is  
your score for this color.



Is this number more than  
5? If yes, then subtract 2  
from your answer to find  
your final score.

 \_\_\_\_\_ - 2 = \_\_\_\_\_  
Your score from the first box

## FUCHSIA = STAKING & TRELLISING

Beneficial, score equals number of  
chips collected!


Number of chips collected: \_\_\_\_\_

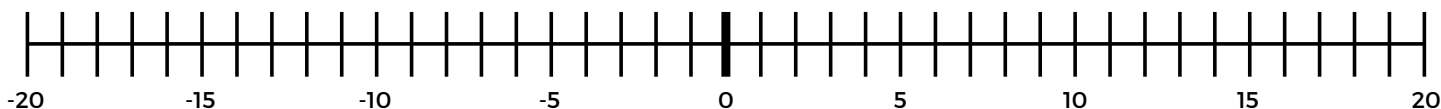
 \_\_\_\_\_ x 1 = \_\_\_\_\_  
The number of color chips collected

Is this number more than  
0? If yes, this is your score  
for this color.

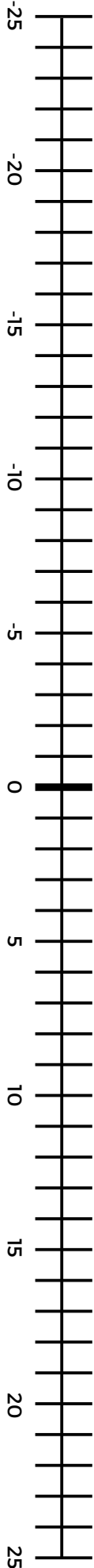


Is this number 0? If yes,  
then subtract 5 from your  
answer to find your final  
score.

 \_\_\_\_\_ - 5 = \_\_\_\_\_  
Your score from the first box



1. Write the total score for each color in the box below. These are the scores for each color from the previous pages.
2. Find the sum of all the individual color scores. This is your overall tree health score! Use the number line and the blank work space to help determine the score.



Yellow	_____
Green	_____
Pink	_____
Orange	_____
White	_____
Purple	_____
Blue	_____
Red	_____
Black	_____
Fuchsia	_____

Math Work Space

