

## **Appendix 1: Honeybee Hive Survival Game (Grades 4-6)**

by Janet Ekstrum

This game is for 10-15 students but can be modified to accommodate up to 20 students. Students will be divided into 3 or 4 hives, depending on the number of students. Each hive contains five students/honeybees. If needed, a hive can have more than 5 honeybees. Every student should be assigned to a hive.

This activity requires students to independently read and add and subtract numbers. If there are parents/teachers aides, have an adult based at each of the stations.

**Core concepts to teach prior to playing this game** 1) general concepts of terms “habitat“, “pollination” and “fitness”, 2) the importance of honeybees to crop pollination, 3) honey bee life cycle and bees’ differing jobs as they get older.

Note: Wikipedia (internet) is a good reference for the honey bee life cycle and the various jobs of the queen, workers, drones and nurse bees.

### **Concepts:**

- The importance of habitat and food availability to the survival of the honeybee hive.
- How survival of the honeybee hive is improved by having many worker/forager bees compared to individual bees living on their own.
- How environmental factors in addition to availability of nectar and pollen affect the survival of a honeybee hive.

### **Materials:**

10 Index cards (per student)

Tally Sheet 1 (one for each student)

Tally Sheet 2 (one for each student)

Pencils or markers for student use

Markers for stations and hives (can be a staked flag or bamboo rod)

A sign for each Station and Hive (signs to be attached to the stakes)

Tape or string to attach signs to sign posts

Baskets (3-4 for the index cards)

Paper lunch bags, 15-20, depending on number of students

Colored name tags, 15-20, depending on the number of students. Name tags should be 3-4 different colors, one color for each group.

Scissors for each student, if students are preparing index cards themselves

## Set Up:

-Prepare the index cards ahead of time. This can be completed by the instructor or an activity for the students.

-Prepare the cards by cutting each scenario statement from the printable sheet at the end of the appendix, then pasting or scotch tape each one to the front of an index card. The number of points can be written on an upper corner of the index card to make tallying easier. Depending on the class, students could even come up with symbols to distinguish beneficial and harmful practices to add to their cards. Students should be instructed their cards will be used by the entire group for the game and are not theirs alone.

-Place a basket with index cards at each marked station (Station 1, 2, 3, 4). Be sure the cards are face-down.

-Have students divide into their groups (hives) and have them put on their colored name tags.

-Place colored signs to match the colored name tags with signs marking Hive 1, Hive 2, Hive 3, Hive 4. These are the home bases for the teams after collecting the index cards.

-Based on the color of the students' name tags, have the students with similar colors gather in a group at one of the "Hive" markers. Each hive will take a turn flying from their hive to three stations to gather cards. A total of six cards will be picked up, two at each station (for 15 students). Students should not read the cards they are picking up. Students should place the index cards into their paper lunch bag. This will assist students with holding cards and keep them from reading the cards until instructed.

-The instructor will need to put a set of index cards in a paper lunch bag to be used later as a demonstration of how to fill out the tally sheet.

## Statements for Index Cards (see printable sheet at end of the appendix):

Place the following statements on the index cards being sure to have a set for each hive. If the game has 15 students participating, each student will draw 6 cards total, 2 cards from each of the three baskets. If the game has 20 students, each student will draw 8 cards total, 2 cards from each of the four baskets. Be sure the cards are well shuffled to reduce the number of times the same card is chosen.

Large open field with many flowers = This card adds 1 Point  
Area with flowering trees, shrubs and flowers = This card adds 2 Points  
Edge of bike path planted with flowers= This card adds 1 Point  
Garden with vegetable plants and flowers = This card adds 2 Points  
Flowers in a garden blooming spring, summer & fall =This card adds 2 Points  
Garden is organic (no artificial fertilizers/chemicals used) =This card adds 2 Pts  
Open field has been turned into a parking lot = This card subtracts 1 Point  
Edge of the bike path has been mowed = This card subtracts 1 Point  
Garden plants treated with pesticide = This card subtracts 2 Points  
Homeowner uses chemicals on their lawn = This card subtracts 2 Points

## **Game Instructions**

Provide time for students to write their names on their paper bag.

Have students put their name tags on. Assure they understand the color of their name tag corresponds with the team (hive) they are a part of.

Describe the activity. Students pretend they are bees flying to the different stations.

Fly to Station 1 as a group. Taking turns, each student picks 2 cards.

Fly to Station 2 as a group. Taking turns, each student picks 2 cards.

Fly to Station 3 as a group. Taking turns, each student picks 2 cards.

If a group of 20 students, Fly to Station 4 as a group. Each student picks 2 cards.

Fly back to the hive and wait for the other team of bees to return.

The game has two tally forms, one for each individual (Tally Form #1), and one for the each hive (Tally Form #2). Note: Tally form #2, if a hive has more than 5 honeybees, modify the form ahead of the game to add in additional honeybees.

The instructor will demonstrate how to tally the cards. The instructor will open their previously saved bag with six random index cards and read each card out loud. They will show the students how to complete the tally form.

Each student will have their own tally form. Each child pulls an index card out of their bag, recording the number onto their tally form. Once all cards are recorded on the tally sheet, the students add and subtract the numbers to come up with their total points.

Parent or Teacher Aides from the “Stations” can move to the “Hives” to assist students in tallying their cards on the tally sheet.

Each child will take a turn to report their total points. The instructor or parent or teacher aide will write these on the hive tally form for each hive.

**Discussion Items** Tally Form #2:

The instructor will ask the student what their individual score was from foraging for index cards.

How does their individual score compare to that of their hive?

Does the hive have a higher score than the individual honeybees?

If a hive has not had good foraging luck, this gives an opportunity to discuss the effect of pesticides on honeybee survival and colony collapse disorder.

**Optional Activity:** if a coloring activity is desired, students could color or decorate their paper lunch bags that will be used for gathering the index cards.

## Tally Sheet #1 - Honeybee Hive Survival Game

Time to tally the index cards! Pick one card from your bag. Read the card and record the number of points in the space matching the statement in the spaces provided below. Continue reading and recording your cards, one by one, until the bag is empty. If the card contains a statement beneficial to honeybees, points will be added. If the statement is harmful to honeybees, points will be subtracted. If the same card was picked more than once, tally the card with the designated points as many times as the card was chosen.

If you picked cards beneficial to honeybees:

“Large open field with many flowers”, record 1 point \_\_\_\_\_+

“Area with flowering trees, shrubs and flowers”, record 2 points \_\_\_\_\_+

“Edge of bike path planted with flowers”, record 1 point \_\_\_\_\_+

“Garden with vegetable plants and flowers”, record 2 points \_\_\_\_\_+

“Flowers in this garden bloom spring, summer and fall, record 2 points \_\_\_\_\_+

“Garden is organic (no chemical pesticides used)”, record 2 points \_\_\_\_\_+

If none of these cards were picked, place zero’s next to the beneficial statement.

Add up the points of beneficial situations: \_\_\_\_\_ Total Beneficial

Now, if you picked any of these cards harmful to honeybees, subtract points from the beneficial point total. As above, if the card was chosen twice, subtract its value twice.

Total Beneficial Points \_\_\_\_\_ -

“Open field has been turned into a parking lot”, subtract 1 point \_\_\_\_\_ -

“Edge of the bike path has been mowed”, subtract 1 point \_\_\_\_\_ -

“Garden plants treated with pesticide”, subtract 2 points \_\_\_\_\_ -

“Homeowner uses chemicals on their lawn”, subtract 2 points \_\_\_\_\_ -



Final Total Points \_\_\_\_\_



## Tally Sheet #2 for Honeybees Hives- Honeybee Hive Survival Game

Hive \_\_\_\_\_  
(color, number or name)

Now it's time to compare the scores of each honeybee in the hive. Do not worry if someone else has a higher score than you, it's the luck of the draw. If the game were played again, it's likely you would have a different score. The purpose of this form is to see whether your hive is better off than each individual honeybee. Do you think the hive will have a higher score (higher fitness) than each individual bee?

Total Points Honeybee #1: \_\_\_\_\_

Total Points Honeybee #2: \_\_\_\_\_

Total Points Honeybee #3: \_\_\_\_\_

Total Points Honeybee #4: \_\_\_\_\_

Total Points Honeybee #5: \_\_\_\_\_

Total Points Honeybee #6 \_\_\_\_\_  
(if applicable)



Total Points for the entire Hive: \_\_\_\_\_

Place a star next to the score from your individual sheet.

Does the hive, with all the individual honeybee's points added together have a higher score than your individual score? \_\_\_\_\_

How do hives benefit from having a large number of individual honeybees?  
\_\_\_\_\_

If your hive did not have a higher number (better fitness) from this particular game, what situations caused the lower numbers? \_\_\_\_\_  
\_\_\_\_\_

Would a hive in nature have a better chance at survival? Yes! Because new flowers bloom every day allowing honeybees to collect nectar and pollen. Even if there's one bad day of foraging, the hive survives from the collective work of all it's members.

## **Printable Sheet for Index Card Preparation, Count Those Critters Game**

Large open field with many flowers = This card adds 1 Point

Area with flowering trees, shrubs and flowers = This card adds 2 Points

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Flowers in a garden blooming spring, summer & fall =This card adds 2 Points

Garden is organic (no chemical pesticides used) =This card adds 2 Points

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