LET'S LEARN ABOUT FLORIDA GREEN BEANS!

This Virtual Farm Field Trip unit is all about green beans. It begins with an informative 5-minute video, transporting students to R.C. Hatton Farms near Hobe Sound, Florida. Your students will meet farmers Charlie and Jonathan to learn how Florida green beans are planted, grown, harvested and distributed.

We encourage you to expand the learning experience using this section's worksheets and guided activities, including a taste test. You may choose to use all these resources or pick the ones best suited to your classroom.





ACCESS VIRTUAL FARM FIELD TRIP

Scan code or visit:
FarmToSchoolFL.com/FieldTrips

FLORIDA GREEN BEAN FUN FACTS

- Green beans are part of the legume family, like black beans, lima beans and chickpeas.
- Green beans have vitamin C, which helps keep your body fueled, and fiber, which helps your body digest food.
- Green beans make a snap when you break them in half. That's why they're often called snap beans.
- Green beans used to be called "string beans" because some varieties had a tough string along the pod you had to pull off before eating. Farmers later created stringless beans, but the nickname stuck around.
- Some green beans climb up tall like a vine, and some grow on short, bushy plants.
- We eat green beans as a vegetable, but scientists consider them a fruit because they are the seed-holding pod of the plant. Open one up and you'll find tiny bean seeds tucked inside!

BEFORE YOU WATCH: DISCUSSION STARTERS

Get students thinking about agriculture, science and nutrition by asking questions such as:

- *Where do the vegetables you eat come from and how do they reach your school?*
- *What do plants need to grow? What happens if they don't get what they need?*
- *Have you eaten green beans before — raw or cooked? What did you think?*
- *A green bean holds seeds inside. What other foods have seeds inside?*
- *As you watch this video, listen for how the farm uses water to help the beans grow.*

TRIVIA TOSS

Want to liven up your video trivia sheet exercise? Have students answer questions or complete their worksheets separately, then come together in teams to compare and finalize answers. Go around the room asking each team a question. If they answer it correctly, they get a chance to toss a ball into one of three buckets to get a prize for their team. Prizes might be a homework pass, free time, extra computer time or lunch in the classroom.

AFTER YOU WATCH: SUGGESTED QUESTIONS

Find video comprehension questions, answers and video timestamps for finding those answers below. See the worksheet section of these resources for a trivia sheet covering the questions below for more independent student work.

- *What are commodities?* ***(Crops grown and harvested on a farm; 0:26)***
- *Why do farmers build raised beds before planting green beans?* ***(To help keep seeds from getting drowned by too much water when it rains; 0:34)***
- *About how many green bean pods does a farmer hope to grow on each plant?* ***(About 20 pods per plant; 0:58)***
- *True or false: The little white flowers on a green bean plant can turn into bean pods.* ***(True; 1:05)***
- *Green beans are part of which plant family?* ***(Legume; 2:33)***

Teacher Tip: Ask students to name other foods in the legume family. Answers might include black beans, kidney beans, chickpeas and lentils.

- *How long does it take a tiny bean pod to grow into a full-sized pod?* ***(About 3 weeks; 1:18)***
- *What kind of effect helps water move through the soil to plant roots?* ***(Capillary effect; 2:08-2:26)***

Teacher Tip: Have students think of other resources that plants need to make their own food besides water.

- *True or false: Green beans are a good source of vitamin C and fiber.* ***(True; 3:37)***

GEOGRAPHY MOMENT

Ask students to find Hobe Sound on a map of Florida. (Hint: It's on the southeastern coast, east of Lake Okeechobee and about 35 miles north of West Palm Beach.)

USING THESE TEACHING TOOLS

Below is an overview and guide for using the teaching tools included in this section, including guided activities, recipes and worksheets. We've included the education standards each tool complements, materials needed for each activity, a brief overview of each tool and tips for building your lessons.

You can find each of these tools on the following pages, along with additional information and pointers.

GUIDED ACTIVITIES

TOOL	COMPLEMENTARY STANDARDS	MATERIALS NEEDED	ABOUT THIS TOOL	TEACHER TIPS
Video, Discussion Questions and Trivia Toss (in Classroom Guide) *On page 253*	Standard(s) Supported: SC.4.L.16.1, SC.4.P.8.1, HE.4.PHC.1.4, HE.5.PHC.1.4	- 3 buckets, boxes or similar containers - Palm-sized balls (enough for each team to have one)	This activity gets students out of their seats as they respond to questions about the Virtual Farm Field Trip video.	Use this activity to complement or reinforce the Green Bean Video Trivia sheet. You might also watch the video a second time after the discussion so students can listen for details they missed.
Green Beans Three Ways *On page 259*	Standard(s) Supported: SC.4.P.8.1, SC.4.P.9.1, HE.4.PHC.1.4, HE.5.PHC.3.2	- Raw green beans in the pod - Freshly steamed green beans (see Quick Steam Green Beans Recipe) - Quick-pickled "dilly" beans (see Dilly Beans Recipe)	In this activity, you'll guide students through tasting green beans three ways – fresh in the pod, steamed and quickly pickled.	Start by asking your school nutrition team if they can support you by acquiring and/or preparing the food items. Use this activity to introduce students to new, nutritious foods. Educate them on the nutritional differences between whole foods – like fresh green beans – and packaged foods with long ingredient lists – like frozen, breaded green beans.

TOOL	COMPLEMENTARY STANDARDS	MATERIALS NEEDED	ABOUT THIS TOOL	TEACHER TIPS
Recipe: Quick Steam Green Beans *On page 261*	Standard(s) Supported: SC.4.P.9.1, SC.4.P.8.1	- Large microwave-safe bowl - Microwave-safe plate or lid - Tongs - Measuring spoons - Bowls or cups to serve - Small microwave-safe bowl (optional, for customizing). - Adjust quantities based on class size: 1 pound fresh green beans, washed with ends trimmed - 2 tablespoons water	Use this recipe to prepare the steamed green beans for the Green Beans Three Ways exercise.	At this grade level, students can trim the beans, measure the water and time the cooking in groups, with you handling the microwave and the hot bowl. Multiply ingredient quantities by the number of groups.
Recipe: Dilly Beans *On page 262*	Standard(s) Supported: SC.4.P.9.1, SC.4.P.8.1	Equipment needed: - 1 quart-sized mason jar with lid - Measuring cup - Spoon to stir - Kid-safe scissors - Small saucepan - Heat source, such as a stovetop, hot plate or classroom-approved cooking appliance (for teacher use only). Materials and ingredients (adjust quantities based on class size): - 1 pound green beans, washed and trimmed to fit the jar standing upright - 1 cup white vinegar - 1 cup water - 1 tablespoon kosher salt - 3 cloves garlic, cut in half - 2 tablespoons fresh dill - 2 tablespoons sugar (optional)	Use this recipe to prepare the quick-pickled “dilly” beans for the Green Beans Three Ways exercise.	Older students can pour the warm brine with close supervision. Have students predict how the beans’ flavor, smell and texture will change during pickling, then compare the fresh and pickled beans and discuss the differences.

TOOL	COMPLEMENTARY STANDARDS	MATERIALS NEEDED	ABOUT THIS TOOL	TEACHER TIPS
Grow Green Beans From Seed: A Science Investigation (Teacher Guide and Student Sheets) *On page 263*	Standard(s) Supported: SC.5.N.1.1, SC.4.L.16.2, SC.4.L.16.1, MA.4.DP.1.3	- Packet of bush green bean seeds - Foam cups, at least four for the Sunny group and four for the Dark group, plus extras for demonstration plants - Sharpened pencils, for poking drainage holes - Seed-starting mix (avoid garden soil or topsoil, which hold too much water and can rot the seeds) - Trays or plates, to set under the cups and catch the water that drains out - A sunny windowsill and a dark closet or light-blocking box - Rulers (centimeters) - Water and a small watering cup - Seed Packet Reading page - Observation Log - Science Report page	In this multi-week investigation, students test whether seeds need sunlight to sprout by growing one group of bean seeds on a sunny windowsill and one in the dark. Both groups sprout, but only the sunny plants stay green and sturdy, introducing students to etiolation and photosynthesis.	This activity complements life science lessons on what plants need and math lessons on measurement and data. Keep the dark cups out of the light except for brief observations, and coach students to judge the plants by color and sturdiness rather than height alone, since the dark-grown plants may actually grow taller.

WORKSHEETS

TOOL	COMPLEMENTARY STANDARDS	MATERIALS NEEDED	ABOUT THIS TOOL	TEACHER TIPS
Green Bean Video Trivia & Farm Math *On page 270*	Standard(s) Supported: MA.4.AR.1.1, MA.4.AR.2.2, MA.5.AR.1.1	- Writing instrument	This worksheet tests students' comprehension of the Virtual Farm Field Trip by asking questions answered in the video, then applies farm facts to word problems.	You might hand the worksheet out before the video so students can answer as they go, or wait until after. Consider pairing it with the "Trivia Toss" activity in this Classroom Guide.
Farm Math: Green Beans *On page 272*	MA.4.AR.1.1, MA.4.AR.2.2, MA.5.AR.1.1, MA.5.AR.2.1, MA.5.AR.2.4, MA.4.M.1.2, MA.4.DP.1.2 / MA.4.DP.1.3	- Writing instrument	This worksheet opens with a box of farm facts, then asks students to use them across a set of multi-step problems: writing and solving equations, converting pounds to ounces, working with remainders and reading a table of one week's harvest.	This worksheet complements math lessons on equations, division and data. Students show their work and carry an answer forward from one problem to the next, so it suits partner work or a guided walkthrough as a class.
What's Inside a Flower? Flower Parts & Pollination *On page 274*	Standard(s) Supported: SC.4.L.16.1, SC.5.L.14.2	- Writing instrument - Crayons, colored pencils or markers (optional)	This worksheet has students (1) label a green bean flower using a word bank, (2) match each flower part with a description of its job and (3) number the four steps from pollination to a growing pod.	This worksheet complements life science lessons about plant reproduction. Green bean flowers usually pollinate themselves, so it also gives students a contrast to the bee-pollinated flowers they may know better.
Life Cycle of a Green Bean *On page 276*	Standard(s) Supported: SC.4.L.16.1	- Writing instrument	This worksheet has students label each stage of the green bean plant's life cycle using a word bank, then briefly describe what is happening in each phase.	This worksheet complements life science lessons about plant life cycles and reproduction. It builds on the 2–3 version by asking students to explain each stage rather than only order it.
Answer Key *On page 277*			See here for answers to each worksheet.	

GREEN BEANS THREE WAYS

This group activity brings the field trip to life as students get the opportunity to taste green beans three ways: fresh in the pod, steamed and quickly pickled.

MATERIALS



Raw green beans in the pod



Freshly steamed green beans *(see recipe on following pages)*



Quick-pickled "dilly" beans *(see recipe on following pages)*

COLLABORATE WITH YOUR CAFETERIA

Consider partnering with your school nutrition team to obtain these food items and/or prepare a green-bean-themed dish for your taste test. Be sure to contact them ahead of time, discuss the support you will need and show gratitude for their collaboration!

SUGGESTED QUESTIONS

Lead a discussion as your students try green beans three different ways. Questions like the following can help kids better connect with their food, think about their preferences and encourage them to make nutritious choices in the future.

Before the tasting:

- *Have you tried green beans before? What did you think?*
- *If not, what do you think they will taste like?*
- *Did you know that you can pickle green beans? Do you know what that means? How do you think pickling might change the green beans' texture or flavor?*

  Teacher Note: Pickling is a way of preserving food by soaking it in a salty or vinegar-based liquid, which can change its flavor and texture.

As they try the fresh green beans:

- *As you bit into the raw green bean, what did you hear? What did it feel like?*
- *Do you like the smell of the fresh green beans? How would you describe it?*
- *Describe the flavor. Is it like green beans you've tasted before? If yes, how so? If not, how is it different?*
- *How would you feel about eating fresh green beans as a snack? Why? What might you eat them with?*

As they try the steamed green beans:

- *How is the warm steamed green bean different from the cold, raw one? Does cooking change the way it tastes?*
- *What do you notice about the texture? Is the steamed bean softer or crunchier than the raw one?*
- *What do you notice about the color of the steamed green beans compared to the fresh ones? Is it brighter or darker?*
- *How do you feel after eating the steamed green beans? Would you like to try them again?*

As they try the pickled "dilly" beans:

- *Have you had regular pickles before? If so, how are the pickled green beans different from or similar to pickled cucumbers?*
- *How does the flavor of the dilly beans compare to the flavor of the fresh green beans? Is it saltier or more sour?*
- *Would you enjoy having dilly beans as a snack? Why or why not?*
- *Before today, did you know that you could change the taste and texture of vegetables by pickling them yourself? What other vegetables would you like to try pickling?*

TEACHER TIP:

Use this as a quick nutrition lesson. Explain that whole foods with just one ingredient — like fresh green beans — are usually more nutritious than packaged foods with a long list of ingredients.

A food with lots of ingredients — like a frozen package of crispy breaded green beans — is like a puzzle with many pieces, and some pieces might not be so nutritious (like lots of sodium). Simple foods you recognize are better for your body and help you feel your best.

Encourage students to count how many ingredients there are in these frozen breaded green beans. Then you may point out the amount of sodium and saturated fat in one serving. Encourage students to compare this to fresh green beans. There isn't an ingredient list — because it's just green beans!



FROZEN CRISPY BREADED GREEN BEANS

Nutrition Facts

About 4 Servings Per Container

Serving size 3 oz (84g/about 24 pieces)

Amount per serving

Calories 210

	% Daily Value*
Total Fat 11g	14%
Saturated Fat 2g	10%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 410mg	18%
Total Carbohydrate 23g	8%
Dietary Fiber 4g	14%
Total Sugars 1g	
Includes 0g Added Sugars	0%
Protein 3g	
Vitamin D 0mcg	0%
Calcium 30mg	2%
Iron 0.7mg	4%
Potassium 170mg	4%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

INGREDIENTS: GREEN BEANS, WHEAT FLOUR, SOYBEAN OIL, WATER, CONTAINS LESS THAN 2% OF: RICE FLOUR, SALT, MODIFIED CORN STARCH, FLAXSEED, SUGAR, LEAVENING (SODIUM ACID PYROPHOSPHATE, SODIUM BICARBONATE, MONOCALCIUM PHOSPHATE), YEAST EXTRACT, DEXTROSE, GARLIC POWDER, ONION POWDER, PAPRIKA EXTRACT (COLOR), SPICE, YEAST.

CONTAINS: WHEAT.

QUICK STEAM GREEN BEANS RECIPE

Estimated Yield: 1 pound green beans (~6 small servings)

EQUIPMENT REQUIRED

- Large microwave-safe bowl
- Microwave-safe plate or lid
- Tongs
- Measuring spoons
- Bowls or cups to serve
- Small microwave-safe bowl (optional, for customizing)

MATERIALS AND INGREDIENTS

Adjust quantities based on class size.

- 1 pound fresh green beans, washed with ends trimmed
- 2 tablespoons water

DIRECTIONS

1. Add the green beans and water to the large microwave-safe bowl and cover with the microwave-safe plate or lid.
2. Microwave on high, checking at the halfway point, for 4–6 minutes, or until the beans are bright green and just tender when pierced with a fork. Time may vary.
3. Carefully uncover the beans (watch for steam) and drain any excess water.
4. Serve warm in cups or bowls.



CUSTOMIZE YOUR BEANS

For a more exciting flavor, melt 1 tablespoon butter or olive oil with 1 minced garlic clove (or ¼ teaspoon garlic powder) in the small microwave-safe bowl, microwaving in short bursts until just melted and fragrant. Pour over the drained beans, season with a pinch of black pepper and toss to coat.

You can also finish the beans with a squeeze of lemon juice or a sprinkle of grated Parmesan cheese.

DILLY BEANS RECIPE

TEACHER NOTE:

Pickled green beans are often called "dilly beans" because they're pickled with dill, a leafy herb that gives them a tangy, savory flavor.

Estimated Yield: 1 quart dilly beans

This activity can be completed as a teacher demonstration or in small groups with teacher assistance.

Students can help wash and pack the green beans, measure ingredients and observe the pickling process, while the teacher handles heating the brine — the mixture of water, vinegar and salt used to pickle and preserve foods — and pouring the hot liquid into the jars.

EQUIPMENT REQUIRED

- 1 quart-sized mason jar with lid
- Measuring cup
- Spoon to stir
- Kid-safe scissors
- Small saucepan
- Heat source, such as a stovetop, hot plate or classroom-approved cooking appliance (for teacher use only)

MATERIALS AND INGREDIENTS

Adjust quantities based on class size.

- 1 pound green beans, washed and trimmed to fit the jar standing upright
- 1 cup white vinegar
- 1 cup water
- 1 tablespoon kosher salt
- 3 cloves garlic, cut in half
- 2 tablespoons fresh dill
- 2 tablespoons sugar (optional)

DIRECTIONS

1. **Students:** Wash the green beans and trim them so they fit inside the jar. Pack the beans upright in the jar with the garlic and dill.
   a. **Tip:** Any beans that don't fit in the jar make a great raw snack — enjoy them fresh!
2. **Students:** Measure the vinegar, water, salt and sugar (if using) into a saucepan.
3. **Teacher:** Heat the mixture on a stovetop until it comes to a gentle boil, stirring until the salt and sugar dissolve.
4. **Teacher:** Carefully remove the brine from the heat and allow it to cool for 2–3 minutes.
5. **Teacher (or older students with close supervision):** Pour the warm brine into the jar until the green beans are completely covered.
6. **Students:** Secure the lid and gently shake the jar to combine the ingredients.
7. Place the jar in the refrigerator and let the beans pickle for at least 2 days before tasting.
8. Store refrigerated and enjoy within about 2 months.

CUSTOMIZE YOUR BEANS

For a spicy punch, add ¼ teaspoon red pepper flakes and ¼ teaspoon whole black peppercorns. Or try swapping half the white vinegar for red wine vinegar.

TEACHER TIP: Have students predict how the green beans' flavor, smell and texture might change during pickling. After tasting, compare the fresh and pickled beans and discuss the differences.

GROW GREEN BEANS FROM SEED: A SCIENCE INVESTIGATION

TEACHER GUIDE

In this multi-week investigation, students test the question: **Do bean seeds need sunlight to sprout?**

They plant two groups of green bean seeds, one on a sunny windowsill and one in a dark closet, then observe what happens over 2–3 weeks.

Students discover an unexpected result: Both groups sprout at about the same time. As the plants continue growing, however, important differences emerge. Through observation and measurement, students learn that seeds do not need light to germinate or even grow, but healthy plants need sunlight to stay green, make their own food and thrive.

MATERIALS

- **Packet of bush green bean seeds**
- **Foam cups — at least four for the "Sunny" group, four for the "Dark" group, plus a few extras for demonstration plants**
- **Sharpened pencils (for poking drainage holes)**
- **Seed-starting mix (avoid "garden soil" or "topsoil," which hold too much water and can rot the seeds)**
- **Trays or plates — to set under the cups and catch the water that drains out**
- **A sunny windowsill and a dark closet (or a box that blocks all light)**
- **Rulers (centimeters)**
- **Water and a small watering cup**
- **Seed Packet Reading page (on following pages)**
- **Observation Log (on following pages)**

HOW TO RUN THE INVESTIGATION

1. Read the Seed Packet

Before planting, have students read the seed packet and complete the Seed Packet Reading page, recording findings such as:

- Planting depth
- Days to germination
- Sun requirements

Point out that the packet calls for "full sun," and pose the investigation's question: The grown plant needs sun, but does the seed need light just to sprout?

2. Set Up the Investigation

You might have each individual student follow the instructions below, or sort them into groups.

1. Poke four small holes in the bottom of each foam cup with a sharpened pencil, plus four more around the lower sides.

   Teacher Note: The holes let extra water drain so the seeds don't sit waterlogged. This is a good moment to ask why every cup needs the same drainage: If one cup drained poorly and stayed soggy, water would become a hidden second variable between the plants, and the test would no longer be fair.

2. Fill each cup with seed-starting mix.
3. Plant two bean seeds in each cup at the depth listed on the packet.
4. Place the Sunny cups on a bright windowsill and the Dark cups in a closet or covered box where no light can reach them.

3. Start a Few Demonstration Seedlings

These become pass-around plants students can handle up close, so some plants can stay undisturbed. Also, some fragile stems will break as students measure them, so it's good to have extras.

OBSERVE AND RECORD

At the beginning of the investigation and every 2–3 days over the next 2–3 weeks, have students observe both groups of plants. Using their observation log, students should:

- Predict what they think will happen to each set of plants
- Record the date
- Note when sprouts appear
- Measure the tallest plant (in centimeters)
- Describe the color
- Describe the strength/sturdiness
- Reflect on the outcome



PROTECT YOUR RESULTS:

When you bring the dark cups out to observe or measure, keep it brief — a few minutes — then return them to the closet. Light causes the dark plants to begin greening, so extended or frequent exposure will erase the contrast you're trying to show.

NOTE: The dark-grown plants may actually grow taller than the sunny ones, so height alone is misleading. Coach students to also note color and sturdiness, such as green and firm versus pale and floppy.

WHAT'S GOING ON? ETIOLATION!

Etiolation (ee-tee-uh-LAY-shun) is what happens when a plant grows without enough light. A seedling in the dark can't make food through photosynthesis, so it channels its limited stored seed energy into stretching its stem upward as fast as it can — a survival gamble to reach light before that stored food runs out. Normally, light works like a brake on stem stretching, and a signal to make chlorophyll, open the leaves and thicken the stem. Remove the light and you remove the brake: The stem shoots up tall, pale and spindly, with small leaves and little to no green. It's also why height is a misleading measure of health here, and why students should judge the plants by color and sturdiness.

TRY THIS NEXT: RESCUE A DARK PLANT

Move one dark-grown seedling into the sunny window and have students predict what will happen. Over the next few days, the pale, stretched plant will green up.

WEEKENDS ARE FINE

A two-day gap with no watering won't hurt your beans at any point in the investigation. Just water the cups well before you leave, and the moist soil will carry them through.

DISCUSSION QUESTIONS

As the plants grow and again at the end, lead a discussion with prompts such as:

- Did the seeds in the dark sprout? Was that what you predicted?
- Which group's plants ended up greener and stronger?
- The dark plants grew tall but pale and weak. Why might a plant in the dark grow tall yet not stay healthy? (Hint: What does a plant need light to do?)
- What was the one variable we tested?
- R.C. Hatton grows its beans in bright, sunny fields. Based on what you saw, why does sunlight matter so much once a plant has sprouted?

TEACHER TIPS & WHAT TO EXPECT

What Students Will Observe

- For the first several days, both groups will look similar as the seeds germinate underground.
- Around days 5–10, seeds in both groups should sprout at about the same time.
- Over the following weeks, differences become easier to spot: Plants grown in sunlight stay green and sturdy, while plants grown in the dark stay pale as they become taller and weaker.
- When the investigation ends after 2-3 weeks, dark-grown plants will decline because they cannot make food without sunlight.

Key Science Concepts:

- Seeds do not need sunlight to germinate because they use energy stored inside the seed.
- Once that stored energy is used, plants need sunlight to make their own food through photosynthesis.
- Sunlight also allows plants to produce chlorophyll, the pigment that makes plants green.

Watering Tip:

Keep the soil evenly moist, like a wrung-out sponge. Water slowly until the first drops reach the drainage holes, then stop and empty any standing water from the tray.

Name _____ **Date** _____

Seed Packet Reading

Farmers and gardeners need to know what a plant needs before they put seeds in the ground. Seed packets provide important growing information, like how deep to plant the seeds, how much sunlight they need and how long they take to grow.

Read your seed packet and fill in the blanks below.

1. What are you growing?

   _____

2. How deep should you plant the seeds?

   _____

3. How many days until germination?

   _____

4. How many days until harvest?

   _____

5. Does your plant require sun, shade or both? How much?

   _____

6. If you were planting outside, when would be the best time to plant based on where you live?

   _____

Draw a picture of your plant.

Name _____ **Date** _____

Green Bean Investigation: Observation Log

Our Question: ***Do bean seeds need sunlight to sprout?***

My Prediction:

1. Will the seeds in the dark sprout? Why or why not?

2. Which group will grow into healthier plants? Why?

Directions: Check your plants every 2–3 days. Measure the tallest plant in each group, and describe its color and how strong/sturdy it looks.

Color: Green / Light Green / Yellow / White

Strength: Strong / Somewhat Weak / Weak & Floppy

Date	Day #	Sunny: Sprouted? (Y/N)	Sunny: Height (cm)	Sunny: Color & Strength	Dark: Sprouted? (Y/N)	Dark: Height (cm)	Dark: Color & Strength

First Sprout Observed:

Sunny group: Day _____ Dark group: Day _____

Name _____ **Date** _____

Science Report

Scientists share their work so others can understand what they did and what they discovered. Use complete sentences to answer each question below.

1. Question: What question were you trying to answer in this investigation?

2. Prediction (Hypothesis): What did you think would happen? Explain why.

3. Variable: What was the one thing you changed in this investigation? What did you keep the same to make it a fair test?

4. Materials and Methods: What materials did you use? What steps did you follow?

Continued →

5. Observations and Data: Use evidence from your Observation Log to answer each of the following questions.

Which group sprouted first? _____

What were the final heights of the plants? _____

How did the plants' color and strength/sturdiness compare? _____

6. Conclusion: Answer the question you were trying to answer in this investigation using the evidence you have collected. Did the bean seeds need sunlight to sprout? What happened to the plants grown without light, and why? Connect it to why R.C. Hatton Farms grows its beans in full sun.

_____

_____

_____

_____

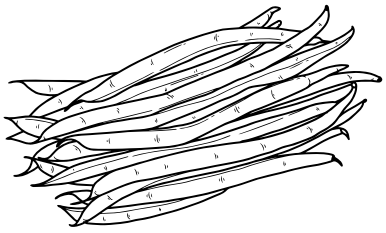
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Name _____ **Date** _____

Green Bean Video Trivia & Farm Math



Directions: Answer these trivia questions based on the video you watched about the Florida green bean farm.

1. How many days does it take for green beans to be ready to harvest? _____
2. What plant family are green beans part of? _____

   Bonus: Name two other foods in that family. _____
3. What happens to the green beans on the "bean line" before they are packaged? _____

   _____

Circle whether the statements below are true or false.

4. Green beans are also called string beans or snap beans.	**TRUE** | **FALSE**
5. Green beans grow underground like potatoes.	**TRUE** | **FALSE**
6. The capillary effect can pull water upward, against gravity.	**TRUE** | **FALSE**
7. Farmers rely only on rain straight from the sky to water green bean crops.	**TRUE** | **FALSE**

Choose the correct word from the word bank to fill each blank.

Word Bank: **irrigate · vitamin C · bed**

8. Farmers build a _____ of raised soil for each row, so the seeds don't get drowned by rain.
9. Culverts, canals and ditches are used to move water and _____ the farm.
10. Green beans are a good source of fiber and _____.

Continued →

Farm Math

Solve each problem and write your answer on the line.

1. One green bean plant grows about 20 pods. About how many pods would 5 plants grow?

_____ pods

2. A bushel of green beans weighs about 28 pounds. About how many pounds do 3 bushels weigh?

_____ pounds

3. A farmer produced 120 green bean pods. If the pods came from 6 plants, and each plant grew the same number of pods, how many pods grew on each plant?

_____ pods

Bonus: Farmer Jonathan harvests 7 bushels of green beans. Remember that each bushel of beans weighs about 28 pounds. He delivers 40 pounds of the beans to school cafeterias and packs the rest into crates that hold 50 pounds each. How many crates will Farmer Jonathan need for the remaining beans?

_____ crates

Farm Math: Green Beans

At R.C. Hatton Farms, green beans grow in wide Florida fields. Each plant grows about 20 pods, and each acre produces around **200 bushels**. A **bushel** of green beans weighs about **28 pounds**, and the beans are ready to harvest roughly **55–63 days** after planting.

Directions: Use these farm facts to solve the problems below. Show your work and write your answer on the line.

1. Each acre produces about **200 bushels** of green beans. One field produced **2,400** bushels. Write and solve an equation using ***a*** for the number of acres.

   Equation: _____ Answer: _____

2. A section of the field contains **35 green bean plants**. If each plant produces about **20 pods**, about how many pods will that section produce?

   Equation: _____ Answer: _____

3. A farmer harvests **9 bushels** of green beans. Each bushel weighs **28 pounds**. Find the total number of pounds they harvested.

   Equation: _____ Answer: _____

4. The farm ships green beans in **5-pound bags**. How many **ounces** are in one 5-pound bag? (Remember: 1 pound = 16 ounces.)

   Equation: _____ Answer: _____

Continued →

5. The farm harvested 500 bushels of green beans. The beans are packed into crates that hold 8 bushels each. How many full crates can they fill, and how many bushels are left over?

Equation: _____

Full crates: _____ Bushels left over: _____

The chart below shows how many bushels the farm harvested each day for one week.

Use the chart to answer the following questions.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Bushels harvested	180	210	195	220	195

6. How many bushels did the farm harvest in all that week?

Equation: _____ Answer: _____

7. What is the range — the difference between the most and the fewest bushels in a day?

Equation: _____ Answer: _____

8. What is the mode — the number of bushels that appears most often? Equation:

Equation: _____ Answer: _____

Name _____ **Date** _____

What's Inside a Flower? Flower Parts & Pollination

Every green bean pod starts out as a small white flower. Before a pod and seeds can form, the flower must be pollinated.

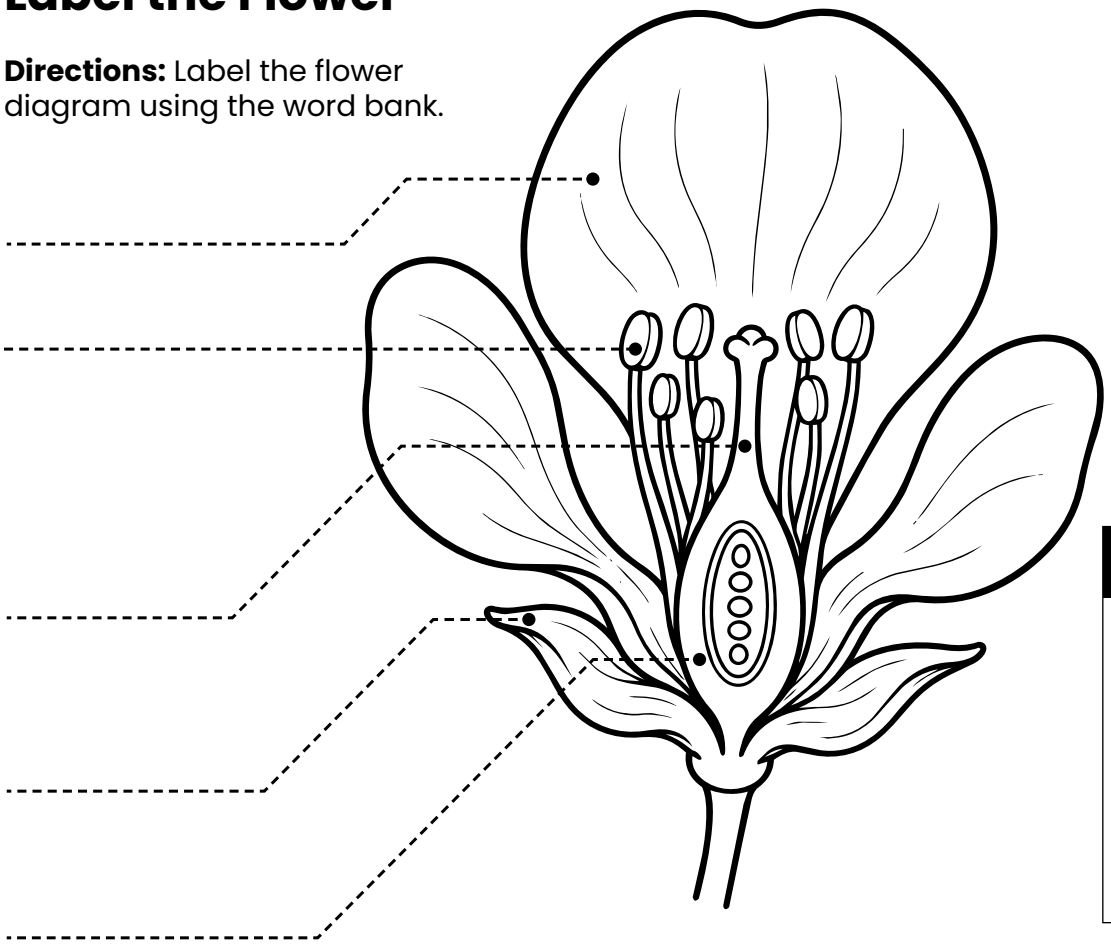
Did You Know?

Many flowers rely on bees or the wind to move pollen. Green bean flowers are different because they usually pollinate themselves. Their pollen moves from the stamen to the pistil inside the same flower.

Bonus Fact: Inside the pistil is the ovary, the part of the flower that grows into the green bean pod after pollination.

Label the Flower

Directions: Label the flower diagram using the word bank.



Word Bank
Petal
Sepal
Stamen
Pistil
Ovary

Continued →

Match Each Part to Its Job

Directions: Draw a line from each flower part to the job it does.

Petal	Makes pollen
Sepal	The colorful part of the flower that can attract pollinators such as bees
Ovary	Receives pollen and holds the ovary, where the seeds form
Stamen	The small leaf-like part that protects the flower bud before it opens
Pistil	Part of the flower that grows into the green bean pod after pollination

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From Flower to Bean

Directions: Number the steps 1–4 in the order they happen.

_____ The flower withers as a tiny pod begins to form.

_____ Pollen from the stamen lands on the pistil.

_____ The pod grows longer as seeds develop inside.

_____ Pollen fertilizes the flower.

Name _____ **Date** _____

Life Cycle of a Green Bean

Directions: Label each part of the green bean plant's life cycle using the terms in the word bank. Then, briefly describe what is happening in each phase.



Word Bank		
Flowering Plant	Seedling	Germination
Seeds (beans)	Sprout	Bean Pod

ANSWER KEY

Name _____ Date _____

Green Bean Video Trivia & Farm Math



Directions: Answer these trivia questions based on the video you watched about the Florida green bean farm.

1. How many days does it take for green beans to be ready to harvest? 55–63 days in the ground. (2:40)
2. What plant family are green beans part of? The legume family. (2:33)
   Bonus: Name two other foods in that family. Example answer: black beans and chick peas (from video)
3. What happens to the green beans on the "bean line" before they are packaged? The beans are washed and their ends are snipped (cut off). (3:41)

Circle whether the statements below are true or false.

4. Green beans are also called string beans or snap beans. **TRUE** FALSE
5. Green beans grow underground like potatoes. TRUE **FALSE**
6. The capillary effect can pull water upward, against gravity. **TRUE** FALSE
7. Farmers rely only on rain straight from the sky to water green bean crops. TRUE **FALSE**

Choose the correct word from the word bank to fill each blank.

Word Bank: **irrigate** · **vitamin C** · **bed**

8. Farmers build a bed of raised soil for each row, so the seeds don't get drowned out by rain.
9. Culverts, canals and ditches are used to move water and irrigate the farm.
10. Green beans are a good source of fiber and vitamin C

Continued →

Farm Math

Solve each problem and write your answer on the line.

1. One green bean plant grows about 20 pods. About how many pods would 5 plants grow?

   20 × 5 = 100 pods

2. A bushel of green beans weighs about 28 pounds. About how many pounds do 3 bushels weigh?

   28 × 3 = 84 pounds

3. A farmer produced 120 green bean pods. If the pods came from 6 plants, and each plant grew the same number of pods, how many pods grew on each plant?

   120 ÷ 6 = 20 pods

Bonus: Farmer Jonathan harvests 7 bushels of green beans. Remember that each bushel of beans weighs about 28 pounds. He delivers 40 pounds of the beans to school cafeterias and packs the rest into crates that hold 50 pounds each. How many crates will Farmer Jonathan need for the remaining beans?

7x28=196 196-40=156 156/50=3 remainder 6. 4 crates crates

Farm Math: Green Beans

At R.C. Hatton Farms, green beans grow in wide Florida fields. Each plant grows about 20 pods, and each acre produces about **200 bushels**. A **bushel** of green beans weighs about **28 pounds**, and the beans are ready to harvest about **55–63 days** after planting.

Directions: Use these farm facts to solve the problems below. Show your work and write your answer on the line.

1. Each acre produces about **200 bushels** of green beans. One field produced **2,400** bushels. Write and solve an equation using **a** for the number of acres.

   200 × a = 2,400 (or 2,400 ÷ 200 = a). a = 12 acres

   Equation: _____ Answer: _____

2. A section of the field contains **35 green bean plants**. If each plant produces about **20 pods**, about how many pods will that section produce?

   20 × 35 = 700 pods

   Equation: _____ Answer: _____

3. A farmer harvests **9 bushels** of green beans. Each bushel weighs **28 pounds**. Find the total number of pounds they harvested.

   9 × 28 = 252 pounds

   Equation: _____ Answer: _____

4. The farm ships green beans in **5-pound bags**. How many **ounces** are in one 5-pound bag? (Remember: 1 pound = 16 ounces.)

   5 × 16 = 80 ounces

   Equation: _____ Answer: _____

Continued →

5. The farm harvested 500 bushels of green beans. The beans are packed into crates that hold 8 bushels each. How many full crates can they fill, and how many bushels are left over?

   500 ÷ 8 = 62 remainder 4. The farm can fill 62 full crates, with 4 bushels left over

   Equation: _____

   Full crates: _____ Bushels left over: _____

The chart below shows how many bushels the farm harvested each day for one week.

Use the chart to answer the following questions.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Bushels harvested	180	210	195	220	195

6. How many bushels did the farm harvest in all that week?

   180 + 210 + 195 + 220 + 195 = 1,000 bushels

   Equation: _____ Answer: _____

7. What is the range — the difference between the most and the fewest bushels in a day?

   Most: 220 (Thu); fewest: 180 (Mon). 220 - 180 = 40 bushels

   Equation: _____ Answer: _____

8. What is the mode — the number of bushels that appears most often? Equation:

   195 bushels (it appears twice; every other number appears once)

   Equation: _____ Answer: _____

ANSWER KEY

Name _____ Date _____

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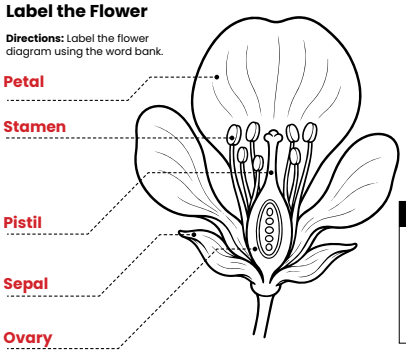
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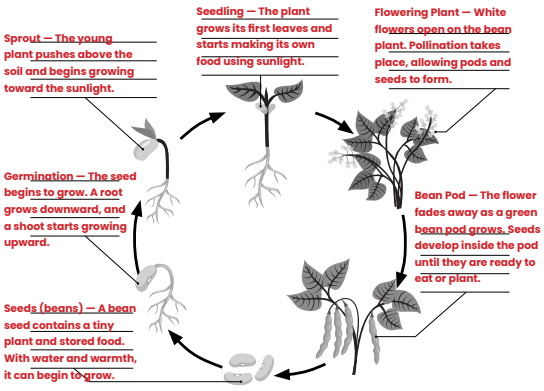
4 The pod grows longer as seeds develop inside.

2 Pollen fertilizes the flower.

Name _____ Date _____

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Flowering Plant	Seedling	Germination
Seeds (beans)	Sprout	Bean Pod

(Accept reasonable descriptions in students' own words. Look for the key idea in each stage.)