Title: Exploring Radishes!
Grade Level: K-2

GPS/CC Standards:
WK2. Students will use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

W12. Students will write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.

W22. Students will write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

SKCS3. Students will use tools and instruments for observing, measuring, and manipulating objects in scientific activities.
   a. Use ordinary hand tools and instruments to construct, measure

S1CS3. Students will use tools and instruments for observing, measuring, and manipulating objects in scientific activities.
   a. Use ordinary hand tools and instruments to construct, measure, and look at objects.

S2CS3. Students will use tools and instruments for observing, measuring, and manipulating objects in scientific activities.
   a. Use ordinary hand tools and instruments to construct, measure, and look at objects.

KMDB3. Students will write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

1MDC4. Students will organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

2MDD10. Students will draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.
Materials Needed:
- Book “Carrots Grow Underground” by Mari Schuh
- Radish Seed Packet
- Enlarged Seed Packet Image (included)
- Seed Catalog (image of radish page included)
- Magnifying Glasses
- Rulers
- Two or Three Varieties of Radishes
- Five Senses Chart (included)
- Poem Worksheet (included)
- Crayons

Time Needed: 45 min

Goal: Students are introduced to different types of radishes and connect their radish observation to writing and math.

Objectives:
- Students observe and learn about several varieties of radishes.
- Students record observations and use them to write a poem.
- Students create a line plot to record the results of a class tasting and interpret the data.

Outline
- Explore: Gather information from observing radishes
- Explain: Gather information from radish seed packets
- Extend: Plant and taste radishes
- Evaluate: Write a poem about radishes

Lesson Plan

Engage (5 min):
- Read “Carrots Grow Underground” by Mari Schuh.
- Ask students what part of the plant do you eat when you eat radishes (root).
- Ask students what other roots you eat (carrots, beets, turnips, parsnips).
Explore (10 min):
- Distribute radishes and observation tools.
- *Small group discussion* – What information can you gather about radishes?
  - Kindergarten – Use your five senses to gather information and make inferences about your radishes.
  - 1st Grade – Use your five senses and your magnifying glass to gather information and make inferences about your radishes.
  - 2nd Grade – Use your five senses, your magnifying glass, and a ruler to gather information and make inferences about your radishes.

Explain (5 min):
- Distribute radish seed packets and seed catalogs.
- *Small group discussion* – What additional information can you gather about radishes?
  - Kindergarten – Look at the pictures. What additional information can you gather about radishes?
  - 1st Grade – Look at the pictures and listen to the words. What additional information can you gather about radishes?
  - 2nd Grade – Look at the pictures and read to the words. What are two adjectives used to describe this variety of radishes?

Extend (10 min):
- Taste two or three different kinds of radishes.
- Create a bar graph based on taste test results.
- Evaluate the bar graph based on the taste test results.
  - Which type of radish was the class favorite?
  - Which type of radish was the least favorite?
  - How many more/less students like (type 1) more than (type 2)?
  - How would the results change if (student) changed their vote to (type 1) instead of (type 2)?

Evaluate (10 min):
- Write a poem about radishes.
  - Kindergarten – Five Senses Poem
  - 1st Grade – Acrostic Poem
  - 2nd Grade – Haiku
- Illustrate poem with a scientific drawing of a radish.
### Rubrics

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Name: ________________________________
Round Red Radishes
Crimson Crunch

START SEEDS OUTDOORS
In early spring as soon as ground can be worked, sow radish seeds in well-worked, fertile soil in full sun. Space seeds 1 inch apart in wide rows 6 inches apart. Cover 1/2 inch deep. Keep soil evenly moist and well weeded. If first sowing comes up unevenly, replant right away. Sow in late spring for a fall crop.

GROWING NOTES
Sow this quick growing, cool season crop wherever you intend to plant heat lovers later. Radishes thrive and have crisp flesh and the best mild flavor given consistent moisture. Sow small amounts a week apart to mature in warm but not hot weather. Thin quick-growing seedlings early to 2 inches apart so roots have room to size up. Protect radishes with floating row covers if marauding birds or flea beetles that chew holes in the leaves are a problem.

HARVEST AND USE
Harvest radishes when roots are the size of large marbles. If weather turns unexpectedly hot, pull, cut off tops, and store in the refrigerator for up to 3 weeks. Radishes will be spicier in hot weather and milder grown in cooler conditions. Combine sliced radishes, scallions and fresh dill or parsley for a great salad. Make delicious open-faced sandwiches on whole grain bread spread with sweet butter and topped with sliced radishes.
Radishes  *Raphanus sativus*

**2874 Celesta F1 Hybrid** 25 days
Excellent vigor, uniformity and bolt tolerance in a red round radish. We're excited to offer the first organically available hybrid radish, which received the highest rating in our 2011 red radish trials across all seasonal trials—spring, summer and fall. We saw hardly any bolting or splitting from this variety, even when allowing the roots to grow quite large. Foliage is strong, compact and upright for easy harvest. Celesta is attractive when sliced with red skin contrasted nicely with bright white flesh. Interior is juicy, with a nice radish crunch.

**2850 Cherry Belle** 25 days
Classic, smooth, red-stemmed bushing radish. AAAS winner in 1949. Makes uniform spheres 3/4"-1" with crisp white flesh. Less subject to pithiness than other radishes.

**2873 Rudolf** 25 days
All the vigor and uniformity of a hybrid in this highly selected open-pollinated radish. Rudolf makes a crisp, nicely round radish with excellent resistance to cracking and pithiness. Good for both winter and spring production. Short foliage.

**2863 Purple Plum** 25 days
Bright purple skin coats firm white flesh. Texture is crisp and juicy. Roots hold up well in the field and do not crack easily. Hardy and adaptable.

**2875 Valentine’s Day Mix** 25 days
A well-balanced mix of red, pink, purple and white round garden radishes with a splash of French Breakfast to liven it up! Sure to create a heart-felt sensation.

**2860 French Breakfast** 26 days
HEIRLOOM. An old, blue-stemmed radish, half red on top and white on the bottom. Has a healthy radish specimen and quality. Can become pithy if harvested late. Average 2" long.

**2870 Pink Beauty** 27 days
Bright pink radish with a uniform round, to oval shape and medium tops. Crisp white flesh has a distinctive and delicious flavor. Highly resistant to pithiness.

**2866 White Icicle** 27 days
Swedish garden radish with polished roots resembles a miniature daikon. Roots average 3-4" long and have a mild radish flavor and crunchy bite. Smooth, medium-size tops can be used as salad greens.

**2865 White Beauty** 30 days
Pure white roots are perfectly round globes averaging 1.5" in diameter. Strong green tops are great for bunching. Bunch with Purple Beauty and Pink Beauty for a colorful display. Best grown in spring or fall.

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**RADIISH PLANTING INFO:** Seedling depth 1/4-1/2", Garden: Plant spacing 6", Row spacing 81/2". Direct: Plant spacing 4-6", Row spacing 12-16".

**CULTURAL INFO:** Radishes are hardy annuals, They can be direct seeded as soon as soil can be worked and are better adapted to the cooler temperatures and shorter days of spring and fall. Optimal soil temperature for germination is 55-85°F. Seedlings emerge within a few days. Thin if necessary to ensure even spacing. Plant every 30 days for a continual supply. Harvest radishes on time as they do not hold well in the field, especially in warm weather. Topped radishes will keep good quality for 3-4 weeks if stored at near freezing temperatures with high humidity in semi-permeable containers.

**DISEASE & PESTS:** Like other cruciferous, radishes can be subject to fungal diseases in wet seasons, such as Alternaria Leaf Spot and White Mold (Sclerotium). Flea beetles can present a problem, particularly for young plants, by chewing small holes in the leaves. Use floating row covers to prevent insect damage.

**SEED SPECS:** 1.875-3.625 (3,750 avg) seeds/lb, 36,580 seeds/pt (100 avg seeds/pt), 1,000 seeds/1/2 lb, 3,400 seeds/lb, 3,000 seeds/100' row, 95,000 seeds/1,000’. Drought resistant, 24 seeds/ft, 12’ row spacing. Direct: 60 seeds/10' (34), 100 seeds/10 feet (28), 1,000 seeds/lb (184), 3,000 seeds/lb (0.64 lbs).
Radishes look __________.
Radishes feel __________.
Radishes sound __________.
Radishes smell __________.
Radishes taste __________.