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Lesson #3
Pulse crops and seed production
Subject Link: Grade 4 math

Objective:

- Students will communicate and apply terms of direction such as North, South, East and West and relate to maps and grids.
- Students will recognize from everyday experience and identify parallel, perpendicular, intersecting, vertical and horizontal lines.
- Students will solve problems using mass (weight) using g and kg.
- Students will see calculators and computers can be used to assist with calculation procedures as part of solving problems.

Anticipatory set:

- Tell the students the following word problem, shown on the whiteboard or overhead projector.
 - o Felicity and Xavier are helping farmer Shawn plan the location and the amount of pulse seed needed to plant his field. The field is going to be planted with four different pulses: yellow peas, green peas, Kabuli chickpeas and Desi chickpeas. They are going to be planting 40 acres of each pulse. Each of the four pulse crops will be planted in their own area of the field. Yellow peas will be planted in the Northeast corner. Green peas will be planted in the Southeast corner. Kabuli chickpeas will be planted in the Southwest corner. Desi chickpeas will be planted in the Northwest corner.

Materials:

Pulse Field Map handout Whiteboard or overhead projector
Computer linked to the web

Procedure:

- Pass out the pulse field map handout and have the students label each pulse crop on the field map according to the directions in the word problem. (Review map directions and horizontal and vertical lines if needed for the students)
 - o Yellow peas will be planted in the Northeast corner. Green peas will be planted in the Southeast corner. Kabuli chickpeas will be planted in

the Southwest corner. Desi chickpeas will be planted in the Northwest corner.

- On the worksheet fill out which pulse crops form horizontal and vertical lines.
 - Desi Chickpeas and Yellow Peas form a horizontal line
 - Kabuli Chickpeas and Green Peas form a horizontal line
 - Desi Chickpeas and Kabuli Chickpeas for a vertical line
 - Yellow Peas and Green Peas form a vertical line

- Using the link to the seeding rating calculator
<http://www.agric.gov.ab.ca/app19/calc/crop/otherseedcalculatorresult.jsp>
calculate the amount of seed need to plant 40 acres of green pea
(Note: these can be quite complex calculations to do by hand. Please use the link above to insert various values into the calculator and obtain answers)
- Explain the following terms as you fill in the calculator
 - Desired plant density (plant/ft²) = 7 plants/ft²
 - The number of plants growing in a square foot. Show using floor tiles what a square foot is and that we want 7 plants to grow in that area.
 - Germination rate (%) = 95%
 - The percentage of seeds that grow seedlings.
 - Emergence mortality (%) = 3%
 - The seeds that germinate but do not survive to be "big" plants.
 - Row spacing (inches) = 12"
 - Each row of seeds is to be planted 12" apart
 - 1000 kernel weight = 225g/1000 seeds
 - The weight of 1000 seeds
 - Acres to planted = 40 acres
 - 40 acres of each pulse crop
 - *The answer will be to seed 40 acres of pea seed you will need 2,977kg of seed.*
- As a class see how the weight of seed changes as you change the following variables. ***(Note: please use the website calculator listed above)***
 - Yellow pea – change the germination rate to 90%
 - Kabuli chickpea – change the 1000 kernel weight to 370g/1000 and the desired plant density to 4
 - Desi chickpea – change the 1000 kernel weight to 200g/1000 and the desired plant density to 4

- Explain to the students that 1kg = 1000g
 - Ask the students to covert the amount of seeds in kg to g

- *Example: 2,977kg = 2,977,000g*
 - As a class discuss why they would give you the seed weight in kg instead of g.
 - *Answer: The number in g is so big etc*
- Ask the students to figure out the total weight of seed needed to plant all four pulses (**Note: please use the website calculator listed above**)
 - *3,142 kg Yellow pea*
 - *2,977 kg Green pea*
 - *2,797 kg Kabuli chickpea*
 - *1,512 kg Desi chickpea*
 - *For a total of 10,428 kg of seed in total.*

Closure:

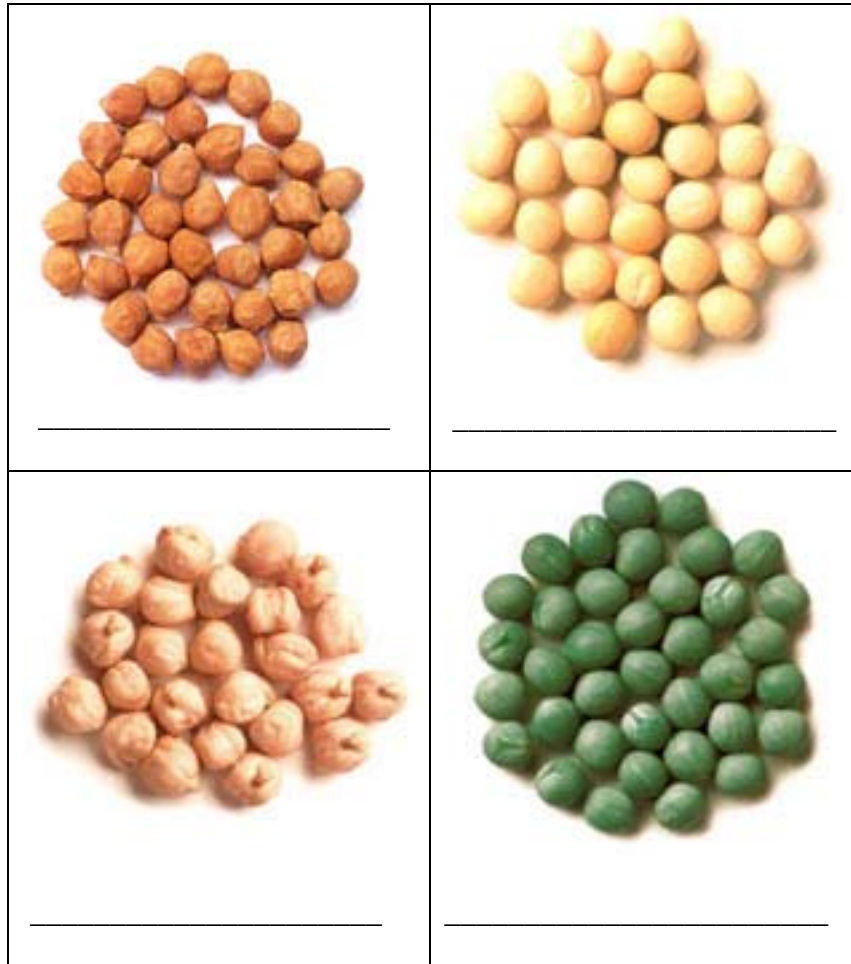
- Review as a class the pulse field map and the amount of seed needed.
- Ask the class to explain to a friend the terms in the seed rating calculator

Evaluation:

- Formal: The pulse field map worksheet
- Informal: Listening to the students explain the terms in the seeding rate calculator

Pulse Field Map

North



West

East

South

Fill in the type of pulse crop to make the statement true.

1. _____ and _____ form horizontal lines.
2. _____ and _____ form horizontal lines.
3. _____ and _____ form vertical lines.
4. _____ and _____ form vertical lines.

Convert the total weight of seed you calculated from kg to g.

Remember 1kg = 1000g

Calculate the total weight of seed needed to plant the entire field with the 4 pulse crops.