Commodity Transport

Welcome, teachers, to the GrowNextGen Commodity Transport Plug-and-Play Lesson. This lesson will take approximately one class period (40 minutes), and will allow students to enhance and expand their knowledge of Commodity Transport. These activities are meant to be flexible for you to use as needed.

Teacher notes: This activity could be completed by individuals, partners or groups of 3–4 acting as farmers. This type of data needs to be collected to determine whether a farmer can store his/her crops, or whether they need to be transported for sale and shipping.

In this activity students will be doing a logistics simulation, determining transportation and storage needs for commodities. For this to occur, an assumption will be made that soybeans yield 50 bushels per acre and corn yields 150 bushels per acre. (It is important to note that the yields in Ohio are slightly different from these values in most cases.)

NextGen Standards

Science and engineering practices
- Asking questions and defining problems
- Developing and using models
- Analyzing and interpreting data
- Using mathematics and computational thinking

Crosscutting concepts
- Scale, proportion and quantity

Disciplinary core ideas/content
- ESS3A Natural resources
- ESS3C Human impact on Earth's systems
- LS1D Information processing
- ETS1B Developing possible solutions
- ETS1C Optimizing the design solution
- ETS2B Influence of engineering, technology and science on society and the natural world

Materials students will need
- 10-sided die (or online die roller at **roll-dice-online.com**)
- 20-sided die (or online die roller at **roll-dice-online.com**)

Setting up your parameters

Using a ten-sided dice labeled from 1–10, roll to determine the average acres of the fields on your farm. Multiply the roll by 10. Record that number in the box to the right.

Using a twenty-sided dice labeled 1–20, roll the number of fields that you have in your farm **(number must be greater than eight).** Record that number in the box to the right.

One last roll of the ten-sided dice will tell you the percentage of your fields that are soybeans (again, multiply the number by 10). The other part will be corn. Record those value in the boxes to the right.

average field size

number of fields

soybeans

corn

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Harvester

300 bushels

The following are available for harvest, transportation and storage.

A harvester is used to collect the crop from the field. Advancement in technology has created the ability for harvesters to carry more crops on board. Normal ranges can be anywhere from 250 to 400+ bushels in one load.

Calculate the number of **harvester loads** it would take to carry your harvest of:

soybeans: _____   corn: _____

Semi

950 bu

Calculate the number of **semi-trailer loads** it would take to carry your harvest of:

soybeans: _____   corn: _____

Calculate the number of **farm grain bins** it would take to store your harvest of:

soybeans: _____   corn: _____
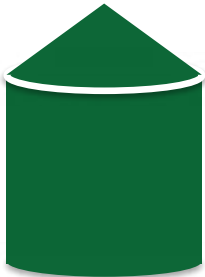
Farm Grain Bin

2,850 bushels

Calculate the number of **commercial grain bins** it would take to store your harvest of:

soybeans: _____   corn: _____

Calculate the number of **commercial grain bins** it would take to store the entire class' harvest of:

soybeans: _____   corn: _____
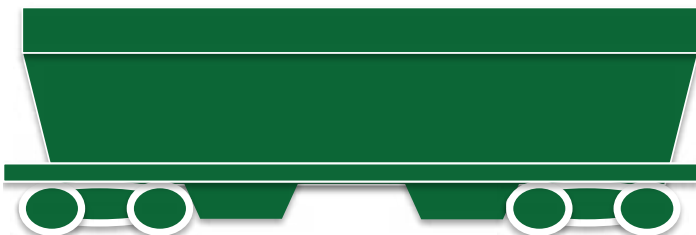
Commercial Grain Bin

750,000 bushels

Calculate the number of **railroad cars** it would take to carry your harvest of:

soybeans: _____   corn: _____

Calculate the number of **railroad cars** it would take to carry the entire class' harvest of:
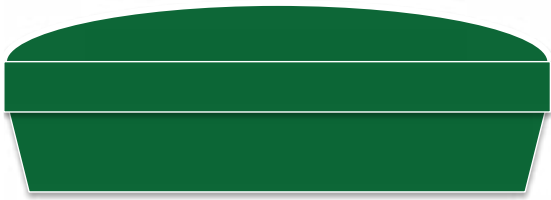
soybeans: _____   corn: _____

Railroad

3,600 bushels

110 car unit
396,000 bushels

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River Barge

45,000 bushels   15 barge tow
675,000 bu

Cargo Container

900 bushels

Ocean Vessel

2,000,000 bushels

Calculate the number of **river barges** it would take to carry your harvest of:

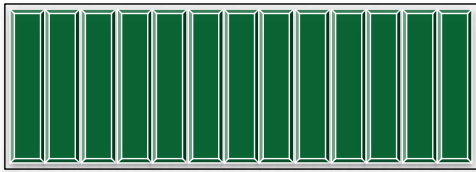soybeans: _____   corn: _____

Calculate the number of **river barges** it would take to carry the entire class' harvest of:

soybeans: _____   corn: _____

Calculate the number of **cargo containers** it would take to carry your harvest of:
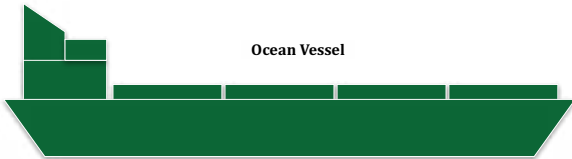
soybeans: _____   corn: _____

Calculate the number of **cargo containers** it would take to carry the entire class' harvest of:

soybeans: _____   corn: _____

Calculate the number of **ocean vessels** it would take to carry your harvest of:

soybeans: _____   corn: _____

Calculate the number of **ocean vessels** it would take to carry the entire class' harvest of:

soybeans: _____   corn: _____

Have students fill in the following chart to determine the weight of each crop hauled.

Equipment	Volume (bushels)	lbs of corn (56 lbs/bushel)	lbs of soybeans (60 lbs/bushel)
Harvester	300		
Semi-trailer	950		
Farm grain bin	2,850		
Commercial grain bin	750,000		
Railroad car	45,000		
Cargo container	900		
River barge	3,600		
Ocean vessel	2,000,000		

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