

Day on the Farm Station

Farm Safety – Grains



OBJECTIVE: Increase awareness about the inherent danger of agricultural life and eliminate attitudes and/or behaviors on the farm that may lead to injury or even death.

LEVEL: Grades K - 4

ESTIMATED TEACHING TIME: 8 -12 minutes depending on activity

SUBJECTS/STANDARDS: Health Education - Health Promotion and Disease Prevention

Standard 1: The student will comprehend concepts related to health promotion and disease prevention as related to injury prevention and safety. Instructional Example:

Describe safe behaviors and accident prevention at home, school and in the community.

Benchmark 1: The student will demonstrate comprehension of basic concepts related to health promotion and disease prevention by identifying and describing relationships between well-being and the health-related behaviors in the content area.

BACKGROUND INFORMATION

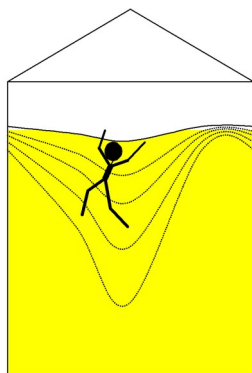
More than 200 million acres in the United States are used to produce various grains including: corn, soybeans, wheat, milo and rice. As with most things on the farm, grain can be dangerous. This lesson also includes a handout and worksheets students can take home. Use this information to create a station for your Kid's Day on the Farm event that warns youth about the dangers of flowing or stored grain and teaches valuable tips that may save someone's life.

When Grain is Dangerous

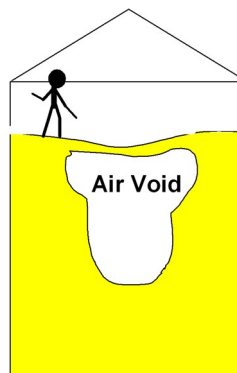
Grain, in mass quantity, moves like water. That makes it dangerous as it can result in entrapment or engulfment.

There are three types of grain entrapment:

- 1) **Flowing grain** - This happens when grain is being moved by a grain-handling system. When a grain bin is emptied, gravity pulls the grain into an auger at the bottom. A gravity flow grain wagon functions the same way.
- 2) **Crusted bridge collapse** - In some situations, like after a wet harvest, a crust will form on top of the grain in a bin creating a bridge. However, as grain is removed it creates a void of empty space forming a sink hole. When the bridge collapses, anyone could be buried. How deep will depend on how much grain is dislodged.
- 3) **Vertical wall collapse** - As the grain is removed from the center of a bin it can form a vertical crust up the wall of the bin. Removing the build up of grain may cause an avalanche, which could bury you.



Flowing grain can submerge a person



Air voids are unseen hazards that can collapse without warning



Teaching the Principle of Gravity Flow - Brief Version (Leader's comments in bold)

Ask "Who knows what **"gravity"** is?" Allow 2-3 children to answer. **"Gravity is the invisible force that makes everything stick to the earth. It also causes the grain to flow out of the gravity wagon and grain bin. When grain flows it makes a "vortex" just like a tornado vortex."**

Demonstrate the mini-grain wagon (or other teaching tool). **"The grain flows very fast. If a person gets caught, or falls into the flowing grain, he could be buried in a very short time – about 10 seconds. We call that 'drowning,' just like in water, because there is no oxygen to breathe. Watch what happens to the toy person when I open the door on the gravity wagon. Help me count the seconds until the person is covered. Ready? 1 - one thousand, 2 - one thousand, 3 - one thousand, etc."** Demonstrate with figure entering from different locations, pointing out they will be pulled down from any place in the grain.

"By the time the person is buried up to their knees, they can't get out by themselves. Why? Because grain is heavy. Does anyone know how heavy grain is? Grain weighs 50 pounds per cubic foot, the size of a 1' by 1' by 1' box." (gesture with hands) **"By the time a person is buried up to their armpits, it would require 400 to 1,000 pounds of force to pull them out. NO ONE is that strong!"**



Teaching the Principle of Gravity Flow - Expanded (Leader's comments in bold)

Show students the gravity flow wagon and ask **"Who can tell me what kind of grain is in the wagon?"** This is the perfect time for a little ag education on what the type of grain in the wagon is used for.

Display one kernel of grain and ask **"Can this one kernel hurt you?"** Get a handful of grain and ask **"Can this handful of grain hurt you?"** Consider touching briefly on the fact that the grain could have chemicals on it that the farmer uses to kill bugs or weeds and that the chemicals could be poisonous to them so it is not a good idea to handle grain if you don't know where it came from.

Explain that **"The real danger involves large amounts of grain like a wagonload, a truckload or a bin load."**

"The woman responsible for this little gravity flow wagon had an 11-year-old son who died in a big one just like it. Now she wants to make sure as many people as possible know just how dangerous things can be on the farm and how quickly things can happen."

"If the grain is flowing, it only takes 2-3 seconds for you to become trapped. In that short amount of time, you would be buried up to your knees. If you are buried up to your knees, you probably aren't going to get yourself out. Someone would have to help dig you out because the grain squeezes in around your body and makes it very hard to get out. If the grain keeps flowing, you would be completely buried in 10-15 seconds. By the time you know you are in trouble (2-3 seconds), it is too late to do anything about it."

"Watch the little person sitting on top of the grain. I'm going to empty the grain into this container. Will you count along with me to see how long it takes the little person's head to go under the grain?" Release the gate to begin the grain flow and start counting. Stop counting when the head goes under, but don't shut off the flow of grain; let it keep running until the body blocks the opening and the grain stops flowing on its own. **This same thing could happen to you!**

"Do you remember the 11-year-old boy I spoke about earlier? That is where his dad found him. They don't know why he got into the wagon but this is what happened to him. Do you think you could breathe in a situation like this? What would you be getting in your lungs if you were trying to breathe...the answer is grain. This boy's father pulled him out of the grain wagon and he was still alive. His Dad rushed him to the hospital but unfortunately, they were not able to save his life. His lungs were full of grain, his stomach was full of grain and his sinuses were full of grain. Grain poured into every open part of his body and filled it with grain. That's why we tell this story, to let you know the same thing can happen anywhere there is a large amount of grain like a truck or a grain bin."

"Should you ever play around grain? The answer is NO WAY."

“GRAIN FLOW”

DEMONSTRATION OPTIONS

Gravity Flow Wagon

- Fill wagon with untreated grain.
- Place toy person on top of grain.
- Have a container (an ice cream pail works well) ready to catch grain as it flows out of the wagon.



Milk Jug

- Clean, then cut the bottom off an empty plastic gallon milk jug.
- Turn the jug upside down and fill it with grain while the cap is on.
- Place a small toy figure on top of the grain and place a container under the cap.
- Remove the cap. As the grain quickly flows out of the jug, it will pull the toy figure along with it.



“GRAIN SUBMERSION”

DEMONSTRATION OPTIONS

2-Liter Pop Bottle

- Clean out an empty 2-liter pop bottle.
- Cut a half-inch hole about three inches from the bottom. Place masking tape over the hole.
- Fill the jug over three quarters full with untreated grain.
- Turn the jug upside down, remove the tape then pick a volunteer to insert a balloon in the hole and partially blow it up.
- Have them pinch the balloon off with their fingers to keep it inflated.
- Turn the jug back over and slowly release fingers from the balloon allowing air to escape and the grain to settle. This step demonstrates air leaving the lungs.
- Have your volunteer try to re-inflate the balloon (be careful they don't over exert themselves). The grain may rise slightly but chances are unlikely they will be able to fully re-inflate the balloon. **Note:** Some participants may be able to inflate the balloon with more effort. Explain the pressure in a large bin will be greater than in the small container and a trapped person would have more trouble trying to breathe.
- Finally, ask the volunteer if they would be able to survive being buried under grain. They always answer NO!

Five Gallon Bucket

- Inflate a balloon and place it at the bottom of a five-gallon bucket.
- Fill the bucket with grain and place a toy figure on top of the grain.
- Pop the balloon with a needle attached to a stick. As the balloon pops, the person will sink into the grain.

MORE DEMONSTRATION OPTIONS

How Much Grain is in a Bushel?

Secure a 12" x 12" cardboard box, place pictures of different types of grain on each of the four sides (grain templates available on the KFB Intranet). This box represents a bushel and if full of grain, it would weigh approximately what some of the students do, between 50 and 60 pounds.

Standard bushel weight:

- Shelled corn = 56 pounds; Corn ears = 70 pounds
- Grain Sorghum (Milo) = 35 to 40 pounds
- Soybeans = 60 pounds
- Wheat = 60 pounds



How Heavy is Grain?

Fill a clear, medium-sized container with grain. Be sure the lid is secure then ask the students to pass it around, ensuring each student is able to experience lifting the container. Your objective is to show the students how heavy that tiny amount of grain is.



- Grain carts vary in size from 550 to 2,000 bushel capacities.
- A common semi-truck grain hopper can hold approximately 1,000 bushels of wheat—or 60,000 pounds of wheat in a single load. Kansas farmers harvest a lot of bushels. According to the USDA National Agricultural Statistics Service (NASS), Kansas farmers typically harvest 37.5 bushels per acre.
- A 27-foot grain bin could hold up to 16,000 bushels while a 48-foot bin could hold close to 60,000.

GRAIN SAFETY TIPS

- Stay out of grain. Never play in/around grain or walk on it to make it flow.
- Never enter a grain bin, wagon or truck.
- Remind participants that only trained rescue personnel should attempt a rescue but here's what they can do to help:
 - 1) Call 911 (see Worksheet One attached). Tell the dispatcher what is wrong so they can send the correct equipment and personnel.
 - 2) If unloading equipment is running - have it shut off immediately. Never start an unloading auger or open a gravity flow gate. The victim will be pulled deeper into the grain.
 - 3) Have someone help turn on fans (making sure the dryer heat is not turned on) to provide as much air as possible to the victim.

How NOT to Report a Farm Accident

If you call 911 to report a farm accident, you can speed up the rescue and help emergency workers by giving the phone dispatcher all the necessary information. Which of these two phone calls does that? What's wrong with the first call? What did the second caller do right?

“My name is Chris. My dad went into our silo and passed out! Hurry, please and get someone out here. We live on that place just past the gas station that has the Holstein cows. It's on Whitehall Road. Oh, please, please hurry! I'm afraid he's gonna die! I'm so scared!”

- OR -



“My name is Chris Smith and our phone number is 555-1234. My dad just climbed into our silo and passed out. He just finished filling it last night. The silo is the old one by the barn, about 50 yards from the driveway of our house.

My sister turned on the blower to get some fresh air in, but I said nobody should go in to the silo or it might make them sick, too.

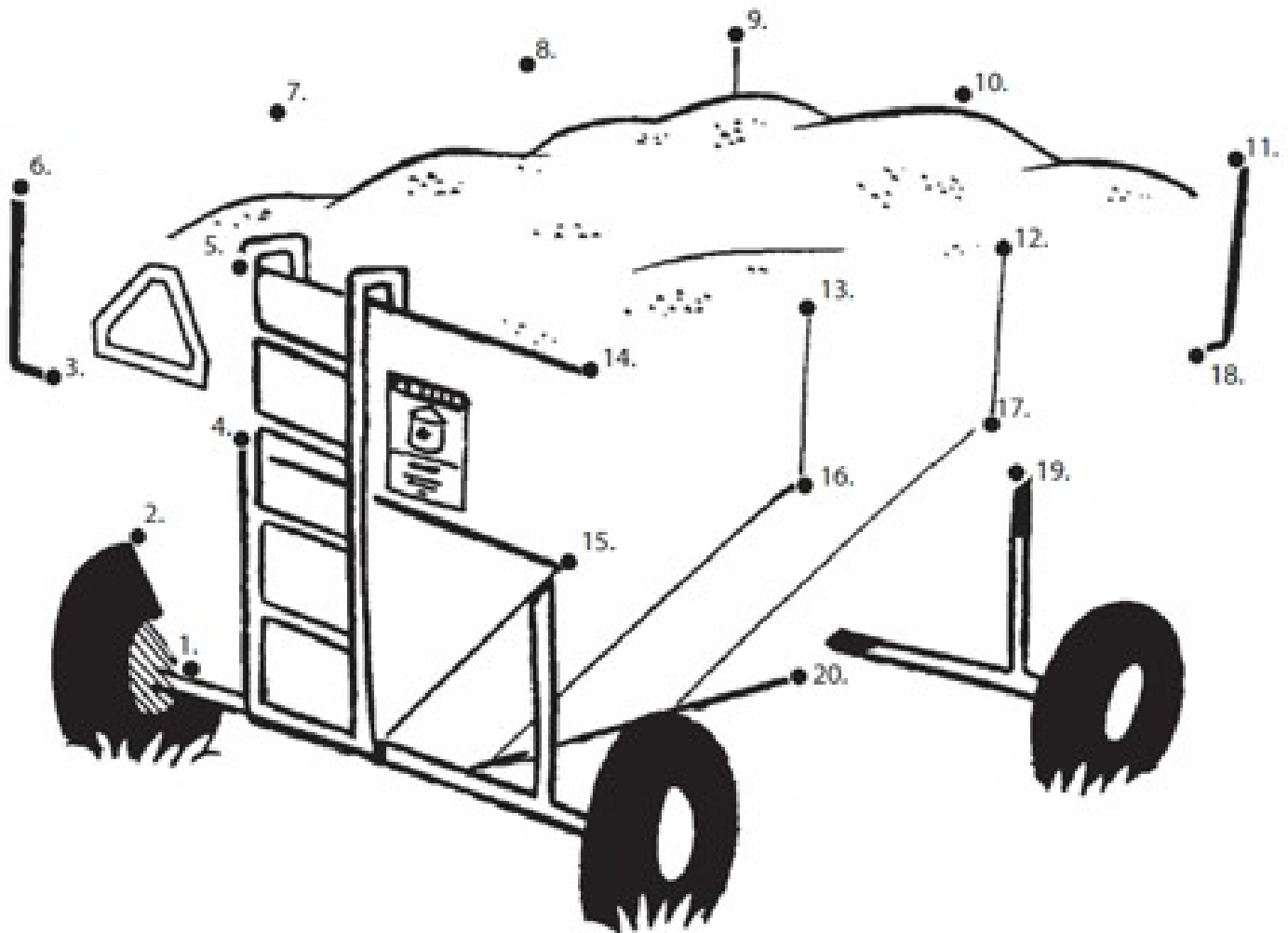
To get to our house, go to the intersection of Route 26 and 322. Then, go three miles on 322 South to the Landmark Dodge dealership. Turn left on Whitehall Road. We are the first house on the left past the Amoco station and we have a big Smith Farm sign.

Do you need any other information?”

Grain Safety

Dot to Dots

Starting at number 1, draw a line between the numbers to finish the picture.
Identify this piece of equipment when you're finished.



Source: nasdonline.org

Grain Safety

Secret Safety Code

Decode the secret messages to find out how to stay safe while around grain.

😊	A
▲	B
▼	C
Ω	D
Π	E
&	F

■	G
e	H
○	I
☀	J
◼	K
□	L

🎵	M
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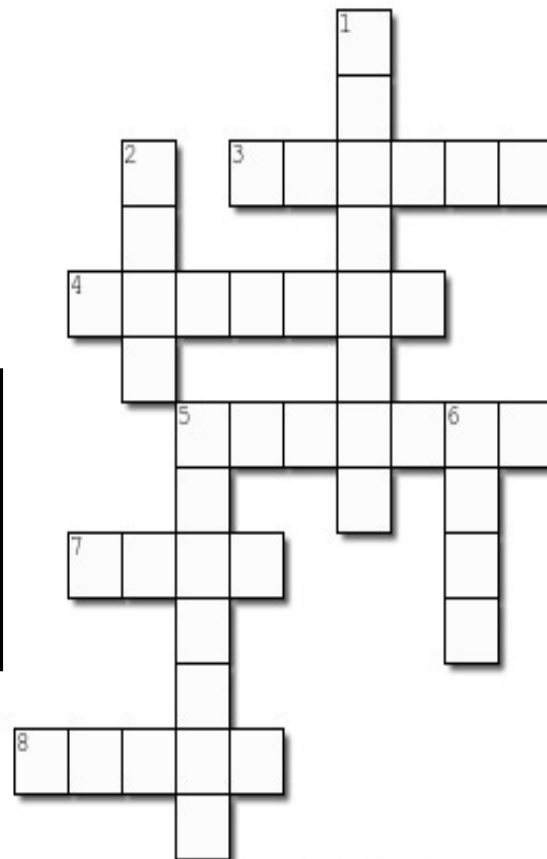
_____.

Source: nasdonline.org

Name: _____

Grain's Pull Crossword

Use the clues to fill in the blanks.



Word Bank

Friction	Flax
Seconds	Gravity
Auger	Weight
Slanted	Bury
Door	

Created using the Crossword Maker on TheTeachersCorner.net

Across

3. Heaviness of grain on the body
4. Force that pulls you downward
5. You can become entrapped in grain in 10 _____ or less
7. Very small grain that entraps people quickly
8. Cork-like device used to move corn

Down

1. Pull of grain on the body
2. Moving grain can do this to you rapidly
5. Shape of gravity flow wagon that helps grain move quickly
6. Opening near the bottom of a gravity flow wagon

Source: nasdonline.org