



The Book Planter



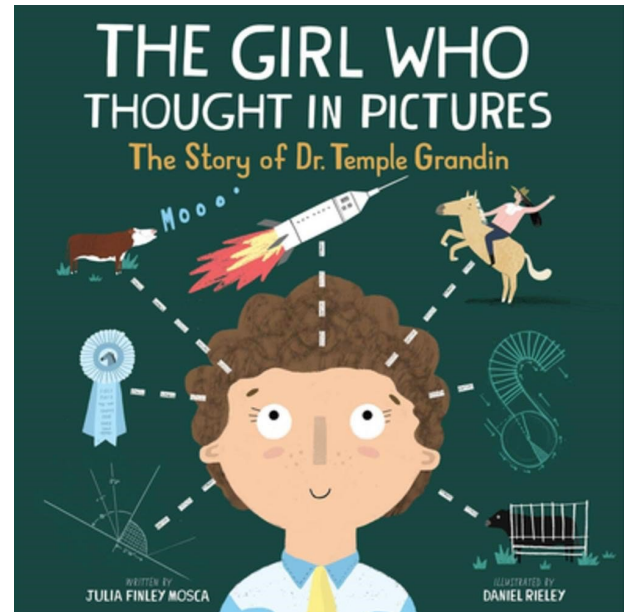
Ag in the Classroom

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***The Girl Who Thought in Pictures:
The Story of Dr. Temple Grandin***
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*If you've ever felt different, if you've ever been low,
if you don't quite fit in, there's a name you should know...*
Meet Dr. Temple Grandin—one of the world's quirkiest science heroes! When young Temple was diagnosed with autism, no one expected her to talk, let alone become one of the most powerful voices in modern science. Yet, the determined visual thinker did just that. Her unique mind allowed her to connect with animals in a special way, helping her to invent groundbreaking improvements for farms around the globe!



Did You Know? (Ag Facts)¹

- Temple Grandin was diagnosed with autism at age 2 and only began speaking after she was four years old. She went on to earn a bachelor's degree in psychology from Franklin Pierce College, a master's degree in animal science from Arizona State University, and a doctoral degree in animal science from University of Illinois.
- In 2010, Dr. Temple Grandin was included in *Time* magazine's list of 1200 most influential people in the world in the "Heroes" category.
- Dr. Grandin is an advocate of humane livestock practices and improvements of standards in slaughter houses, serves as a consultant to the livestock industry regarding animal treatment and behavior, and is a professor at Colorado State University.

Vocabulary

Agricultural engineer: career in which people design farm machinery or help plan farm structures.

Alleyway: a narrow corridor built for livestock to travel through when being herded from one location to another nearby.

Flight zone: distance from an animal that a handler must maintain for the animal to feel comfortable.

Handling: the manner in which an animal is treated.

Livestock: farm animals (such as cows, horses, and pigs) that are kept, raised, and used by people.

Squeeze chute: a device used to restrain large animals, especially cattle and horses.

Interest Approach – Engagement¹

1. Discuss the words and definitions from the [Thinking in Pictures Word List](#).
2. Use the [Thinking in Pictures Frayer Model](#) to focus on unfamiliar vocabulary words.
3. Show the students the video [Thinking in Pictures: The Temple Grandin Story](#).
4. Discuss what it would be like to “think in pictures.”
5. Share words from the word list and ask students to share what they see in their mind. Emphasize that there are no right or wrong ways to think; we all think differently.
6. Next, divide students into two teams and explain the game rules for “thinking in pictures.”
7. Each student will take turns being the team illustrator.
8. Set the timer for 3-5 minutes. Both teams will pick a card and draw at the same time. For each new word, a new person should draw. Teams will keep track of how many words they guess correctly. The team with the most correct words wins. The teams will have the same words to illustrate, but might not draw them in the same order.
9. Explain to the students that they will be exploring how “thinking in pictures” helped Temple Grandin to develop livestock management systems that benefitted the animals and the agricultural industry.

Activity 1: Comparing Inventors¹

1. Read the books *The Girl Who Thought in Pictures: The Story of Dr. Temple Grandin* by Julia Finley Mosca and *John Deere, That's Who!* by Tracy Nelson Maurer.
2. Have the students use the [Temple Grandin](#) and [John Deere](#) reading pages and the [Comparing Inventors Timeline](#) to construct a timeline for both Dr. Grandin and John Deere to show important dates in the lives of the inventors.
3. Lead a discussion about how Temple Grandin’s and John Deere’s inventions benefitted agriculture.
4. Provide each student with a copy of the [Comparing Inventors Venn Diagram](#) and ask them to complete the graphic organizer to show similarities and differences between the inventors and their inventions.

Activity 2: Cattle Flight Zones¹

1. Show the video [Understanding the Flight Zone](#) to help students understand what a flight zone is and how it affects the comfort of the animals.
2. Discuss cattle movement and how entering and exiting the flight zone affects their movement.
3. Pass out a [Cattle Flight Zones Reading Page](#) and a [Cattle Flight Zones Reading Comprehension Sheet](#) to each student. Ask the students to do a close reading of the reading page and then complete the comprehension sheet.

Activity 3: Curved Cattle Chute¹

Materials:

- | | | |
|--------------------------------|------------|--------------|
| • Paper plates with high edges | • Scissors | • Tape |
| | • Glue | • Card stock |

- Yarn
 - Straws
 - Construction paper
 - Pipe cleaners
 - Marbles
1. Present the following scenario to the students: *A local cattle operation has a problem. They need to move their cattle from the pasture through a cattle chute to doctor them, but the cattle are afraid to walk through the chute.*
 2. Explain to the students that their job is to design a cattle chute using the following guidelines:
 - a. The chute should have at least 3 turns causing the cattle to change directions.
 - b. The chute should end with a squeeze chute or a pen to collect cattle.
 - c. The chute should start wide and then narrow as it reaches the squeeze chute or final pen, requiring the cattle to move through a single-file line.
 3. Pass out an [Engineering Process](#) handout to each student. Walk through the engineering process as a class.
 4. Organize the students into small groups and have each group work as a team to design a cattle chute using the Engineering Process.
 5. Provide each group with a paper plate, scissors, glue, and tape and access to card stock, yarn, straws, construction paper, and pipe cleaners to construct their prototypes. Give each group marbles to represent the cattle who will be moving through the chute.
 6. After the prototypes are built and tested, allow time for the groups to share their designs. Ask the students to consider the following:
 - a. What happened to the marble's motion when it hit a wall?
 - b. Can motion be a change in energy?
 - c. How does this compare to how cattle process information and respond to the chute and/or distractions?
 7. Show the video [Design of Curved Chutes](#).
 8. Discuss cattle movement and chute design. How do cattle use their senses to process information? Discuss how the chutes on the video are similar and different from the student designs.
 9. Challenge the students to modify their projects to create a chute that follows Dr. Grandin's guidelines—solid walls and curved alleyways which narrow—but do not duplicate the chute shown in the video.
 10. Have students measure the length and width of their alleyways and the angle of their turns and then compare their designs. Ask the students to consider the following:
 - a. Which angles worked best to turn the cattle?
 - b. Does the length and width of the alleyways affect the cattle movement?
 - c. What is the widest the chute can be to only allow one calf to pass through at a time?

Links

- *Thinking in Pictures Word List (Interest Approach – Engagement)*
https://cdn.agclassroom.org/media/uploads/2019/06/26/Thinking_in_Pictures_Word_List_1.pdf
- *Thinking in Pictures Frayer Model (Interest Approach – Engagement)*
https://cdn.agclassroom.org/media/uploads/2020/03/09/Think_in_Pictures_Frayer_Model.pdf

- Thinking in Pictures: The Temple Grandin Story – video (**Interest Approach – Engagement**)
<https://www.youtube.com/watch?v=4Kc3yD48CmQ>
- *Temple Grandin Reading Page (Activity 1)*
https://cdn.agclassroom.org/media/uploads/2020/03/09/Temple_Grandin_Reading_Page.pdf
- *John Deere Reading Page (Activity 1)*
https://cdn.agclassroom.org/media/uploads/2020/03/09/John_Deere_Reading_Page.pdf
- *Comparing Inventors Timeline (Activity 1)*
https://cdn.agclassroom.org/media/uploads/2020/03/09/Comparing_Inventors_Timeline.pdf
- *Comparing Inventors Venn Diagram (Activity 1)*
https://cdn.agclassroom.org/media/uploads/2020/03/09/Comparing_Inventors_Venn_Diagram.pdf
- Understand the Flight Zone – video (**Activity 2**)
<https://www.youtube.com/watch?v=lwu8Ncrl0z0>
- *Cattle Flight Zones Reading Page (Activity 2)*
https://cdn.agclassroom.org/media/uploads/2020/03/10/Cattle_Flight_Zones.pdf
- *Cattle Flight Zones Reading Comprehension Sheet (Activity 2)*
https://cdn.agclassroom.org/media/uploads/2020/03/10/Cattle_Flight_Zones_Comprehension_Sheet.pdf
- *Engineering Process handout (Activity 3)*
https://cdn.agclassroom.org/ok/resources_classroom/engineering/early.pdf
- Design of Curved Cattle Corrals, Yards, Races, and Chutes – video (**Activity 3**)
<https://www.youtube.com/watch?v=EZ1VzDSmsNk>

Sources

1. <https://www.agclassroom.org/matrix/lesson/710/>

K-5 Subject Areas

Reading, Visual Arts, Writing, Speaking and Listening, Visual Art, Science, and Social Studies

NC Standard Course of Study

Reading

- **RL.K.1** With prompting and support, ask and answer questions about key details in a text.
- **RL.K.3** With prompting and support, identify characters, settings, and major events in a story.
- **RL.K.4** With prompting and support, ask and answer questions about words in a text that suggest feelings or appeal to the senses.
- **RL.K.9** With prompting and support, compare and contrast the adventures and experiences of characters in familiar stories.
- **RL.1.1** Ask and answer questions about key details in a text.
- **RL.1.2** Retell stories, including key details, and demonstrate understanding of their central message or lesson.
- **RL.1.3** Describe characters, settings, and major events in a story, using key details.
- **RL.1.9** Compare and contrast the adventures and experiences of characters in stories.
- **RL.2.1** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
- **RL.2.3** Describe how characters in a story respond to major events and challenges.
- **RL.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- **RL.3.3** Describe characters in a story and explain how their actions contribute to the sequence of events.
- **RL.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RL.4.3** Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text.
- **RL.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RL.5.2** Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.
- **RL.5.3** Compare and contrast two or more characters, settings, or events in a story or drama, drawing on specific details in the text.
- **RI.K.1** With prompting and support, ask and answer questions about key details in a text.
- **RI.K.2** With prompting and support, identify the main topic and retell key details of a text.
- **RI.K.3** With prompting and support, describe the connection between two individuals, events, ideas, or pieces of information in a text.

- **RI.K.9** With prompting and support, identify basic similarities in and differences between two texts on the same topic.
- **RI.1.1** Ask and answer questions about key details in a text.
- **RI.1.2** Identify the main topic and retell key details of a text.
- **RI.1.3** Describe the connection between two individuals, events, ideas, or pieces of information in a text.
- **RI.1.9** Identify basic similarities in and differences between two texts on the same topic.
- **RI.2.1** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
- **RI.2.3** Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
- **RI.2.9** Compare and contrast the most important points presented by two texts on the same topic.
- **RI.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- **RI.3.2** Determine the main idea of a text; recount the key details and explain how they support the main idea.
- **RI.3.3** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
- **RI.3.9** Compare and contrast the most important points and key details presented in two texts on the same topic.
- **RI.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RI.4.2** Determine the main idea of a text and explain how it is supported by key details; summarize the text.
- **RI.4.3** Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
- **RI.4.5** Describe the overall structure of events, ideas, concepts, or information in a text or part of a text.
- **RI.4.7** Interpret information presented visually, orally, or quantitatively and explain how the information contributes to an understanding of the text in which it appears.
- **RI.4.9** Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.
- **RI.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RI.5.2** Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
- **RI.5.3** Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
- **RI.5.5** Compare and contrast the overall structure of events, ideas, concepts, or information in two or more texts.
- **RI.5.6** Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.
- **RI.5.7** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question or to solve a problem efficiently.
- **RI.5.8** Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).
- **RI.5.9** Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

Visual Arts

- **K.CX.2.2** Identify relationships between art and concepts from other disciplines, such as math, science, language arts, social studies, and other arts.
- **1.V.2.3** Create art from imaginary sources of inspiration.
- **1.CX.1.5** Understand that art is a reflection of the artist's ideas, environment, and/or resources.
- **1.CX.2.2** Identify connections between art and concepts from other disciplines, such as math, science, language arts, social studies, and other arts.
- **2.V.2.3** Create art from real and imaginary sources of inspiration.
- **2.CX.2.2** Understand relationships between art and concepts from other disciplines, such as math, science, language arts, social studies, and other arts.
- **3.V.2.2** Use personal point of view and experiences as sources for creating art.
- **3.V.2.3** Create art from realistic sources of inspiration.
- **3.CX.2.2** Understand how to use information learned in other disciplines, such as math, science, language arts, social studies, and other arts in visual arts.
- **4.V.1.2** Apply personal choices while creating art.
- **4.CX.2.2** Apply skills and concepts learned in other disciplines, such as math, science, language arts, social studies, and other arts, in the visual arts.
- **4.CR.1.1** Use visual clues to interpret the content of art.
- **5.CX.2.2** Exemplify how information and skills learned in art can be applied in other disciplines.

Writing

- **W.K.5** Participate in shared investigation of grade appropriate topics and writing projects.

- **W.K.6** With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.
- **W.1.5** Participate in shared research and writing projects.
- **W.1.6** With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.
- **W.2.5** Participate in shared research and writing projects.
- **W.2.6** Recall information from experiences or gather information from provided sources to answer a question.
- **W.3.2** Write informative /explanatory texts to examine a topic and convey ideas and information clearly.
- **W.3.5** Conduct short research projects that build knowledge about a topic.
- **W.3.6** Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
- **W.4.2** Write informative /explanatory texts to examine a topic and convey ideas and information clearly.
- **W.4.5** Conduct short research projects that build knowledge through investigation of different aspects of a topic.
- **W.5.2** Write informative /explanatory texts to examine a topic and convey ideas and information clearly.
- **W.5.5** Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

Speaking and Listening

- **SL.K.1** Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
- **SL.K.2** Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.
- **SL.K.3.** Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- **SL.K.4.** Speak audibly and express thoughts, feelings, and ideas clearly.
- **SL.K.5** Add drawings or other visual displays to descriptions as desired to provide additional detail.
- **SL.1.1** Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.
- **SL.1.2** Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- **SL.1.3** Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.
- **SL.1.4** Produce complete sentences to describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.
- **SL.1.5** Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.
- **SL.2.1** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
- **SL.2.2** Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- **SL.2.3** Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
- **SL.2.4** Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent and complete sentences.
- **SL.2.5** Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.
- **SL.3.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.3.2** Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- **SL.3.3** Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- **SL.3.4** Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly in complete sentences at an understandable pace
- **SL.4.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.4.2** Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- **SL.4.3** Identify the reasons and evidence a speaker provides to support particular points.
- **SL.4.4** Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; adjust speech as appropriate to formal and informal discourse.
- **SL.5.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.5.2** Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

- **SL.5.3** Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.
- **SL.5.4** Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; adapt speech to a variety of contexts and tasks.

Science

- **K.P.1** Understand the positions and motions of objects and organisms observed in the environment.
- **K.L.1** Compare characteristics of animals that make them alike and different from other animals and nonliving things.
- **1.P.1** Understand how forces (pushes or pulls) affect the motion of an object.
- **1.L.1** Understand characteristics of various environments and behaviors of humans that enable plants and animals to survive.
- **1.L.2** Summarize the needs of living organisms for energy and growth.
- **3.P.1** Understand motion and factors that affect motion.
- **4.P.1** Explain how various forces affect the motion of an object.
- **4.L.1** Understand the effects of environmental changes, adaptations and behaviors that enable animals (including humans) to survive in changing habitats.
- **5.P.1** Understand force, motion and the relationship between them.

Social Studies

- **1.H.1** Understand how people and events have changed society over time.
- **2.H.1** Understand how various people and events have shaped America.
- **3.H.1** Understand how various people and historical events have shaped local communities.
- **5.H.1** Understand the role of various people, events, and ideas in shaping the United States.

Thinking in Pictures: Word List

CATTLE cows or bulls kept on a ranch for meat or milk	FRUIT a usually sweet food that grows on a tree or bush	VEGETABLE a plant or plant part that is eaten as food
RANCHER a person who lives or works on a ranch	COMBINE machine that cuts crops & separates seeds from plants	WHEAT grain used to make flour for breads, cookies, etc.
HARVEST the activity of gathering crops from the field	GARDEN area of ground where plants (ie. vegetables) are grown	CATTLE CHUTE stall for holding cattle safely while they're examined
SOIL the top layer of earth in which plants grow	WATER liquid that falls from clouds as rain, and forms ponds, streams, and lakes	INSECTS small animal with 6 legs, body formed of 3 parts and may have wings
WEATHER air and atmosphere at a particular time and place	TRACTOR large vehicle that is used to pull farm equipment	GRAIN the seeds of plants (ie. wheat, corn) used for food
SHEEP animal with thick woolly coat raised for meat or wool	HOGS a pig that is raised for meat	HORSES large animal used for riding or carrying/pulling things
LIVESTOCK farm animals kept, raised, and used by people	SCARF piece of cloth worn around your neck	SHIRT piece of clothing, for the upper body, that has sleeves

Thinking in Pictures: Word List

ACRE measure of land area that equals 4,840 square yards	BARN building on a farm used to store animals, or equipment	BISON large, hairy animal with big head, also called buffalo
CHICKENS a bird that is raised for its eggs and meat	DUCKS birds that swim, have flat beak and webbed feet	COTTON white fiber that grows on a plant, used to make cloth
INVENTOR person who invents things for a living	SEEDS part of a plant which can grow into a new plant	VETERINARIAN person trained to give medical care to animals
FEEDLOT area where livestock are fed or fattened up	ORCHARD place where people grow fruit trees	VACCINATION to give a vaccine to prevent infection by a disease
DROUGHT long period of time with very little or no rain	DAIRY a farm that raises cattle and produces milk	BEEF meat from cattle (ie. steak, hamburger)
GOAT small animal related to sheep, raised for meat/milk	HERD group of animals that live or are kept together	MANURE solid waste from farm animals used to make soil better for growing plants
MILK white liquid produced by cattle to feed their young	TURKEY large bird related to chicken, raised for its meat	FARMER person who runs a farm

Think in Pictures Frayer Model

Name: _____ Date: _____

Definition (in your own words) Farm animal with 4 legs that give us meat or milk. Cows or bulls that live on a ranch.	Word Cattle	Facts/Characteristics Bulls are boys, cows are girls. Cows give milk. Baby calves are born alive.
Examples Angus cattle are black. Hereford cattle are red and white.		Non-Examples Horses Sheep Chickens

Definition (in your own words)	Word	Facts/Characteristics
Examples		Non-Examples

Definition (in your own words)	Word	Facts/Characteristics
Examples		Non-Examples

Think in Pictures Frayer Model

Name: _____ Date: _____

Definition (in your own words)	Word	Facts/Characteristics
Examples		Non-Examples

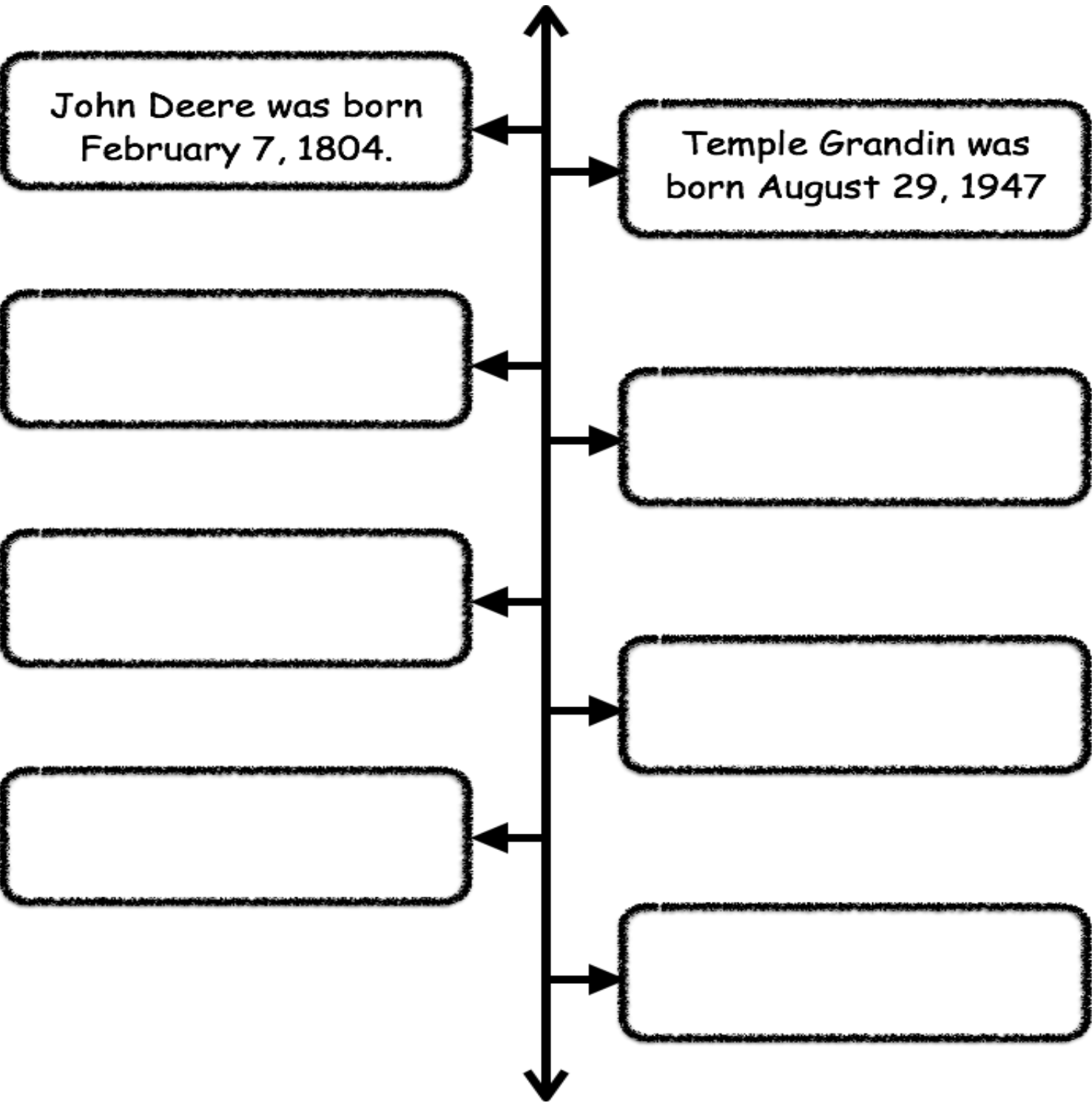
Definition (in your own words)	Word	Facts/Characteristics
Examples		Non-Examples

Definition (in your own words)	Word	Facts/Characteristics
Examples		Non-Examples

Comparing Inventors Timeline

Name: _____ Date: _____

Complete the timeline comparing the lives of two agriculture inventors: John Deere and Temple Grandin. Use the left side for John Deere and the right side for Dr. Temple Grandin. Include important dates for their inventions.



Comparing Inventors: Dr. Grandin's Life

Temple Grandin was born on August 29, 1947 in Boston, Massachusetts. She did not talk until she was three and a half years old. At the age of two, doctors said that Temple had autism. Autism often makes it hard for someone to talk or know how others are feeling.

Temple loved math and science, but school was hard. Other children made fun of her for being different. When she was 14, she threw a book at a classmate and was expelled from school. In 1961, she spent the summer at her aunt's ranch in Arizona. Her aunt had cattle and Temple liked them. Temple often says that she “thinks in pictures.” She saw that cattle think like her. Cattle see details around them that most people miss.

In 1965, Temple created her first invention, a squeeze machine. This idea came from cattle chutes she saw on her aunt's ranch. Cattle chutes keep cattle calm when they are given shots by holding the cattle firmly. Temple's squeeze machine holds people firmly, like a hug.



Temple Grandin's Squeeze Machine

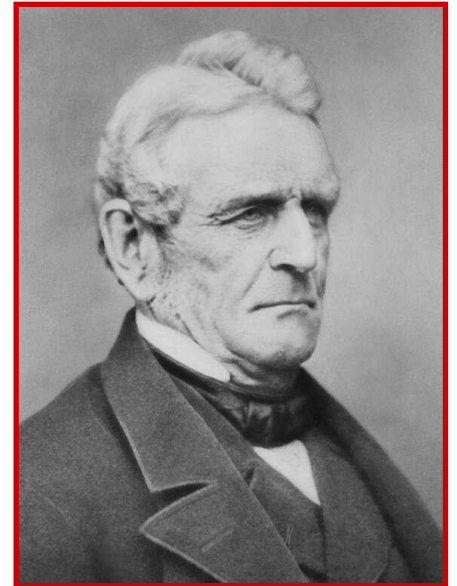


Temple earned a college degree in psychology in 1970, and a master's degree in animal science in 1975. In 1976, she invented the curved chute for moving cattle. The curved system keeps cattle calm. She earned her doctoral degree in animal science in 1989.

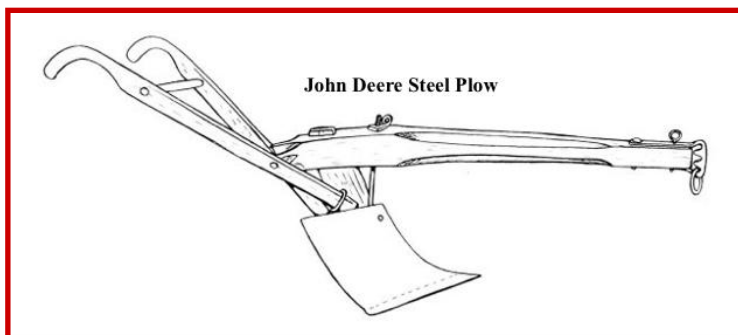
Dr. Grandin was inducted into the National Cowgirl Hall of Fame in 2010 and was also named one of *Time* magazine's 100 most influential people that year. Today, more than half of the cattle in the U.S. are handled using her curved chute design. This allows ranchers to keep their cattle calm as they doctor them. Dr. Grandin is a professor at Colorado State University.

Comparing Inventors: John Deere's Life

John Deere was born on February 7, 1804 in Rutland, Vermont. In 1821, he became an apprentice to a blacksmith. In 1826, he became a blacksmith. John was a hard worker and was smart. He was able to find work easily. There were a lot of farmers who needed him to work on their farm equipment.



In 1836, John Deere moved his family to Illinois. John Deere started his own business in 1837. He named it Deere and Company, and he made farm equipment. As farming spread across the nation, farmers in Illinois had a hard time plowing the heavy, sticky prairie soil. They were using cast iron plows made for Vermont. These plows were made for light, sandy soil.



John Deere came up with the idea for a plow that would work in the sticky soil. It was shaped so that it could clean itself as it cut furrows, or rows, in the soil. In 1837, he created his stainless steel plow using a broken saw blade. By 1841,

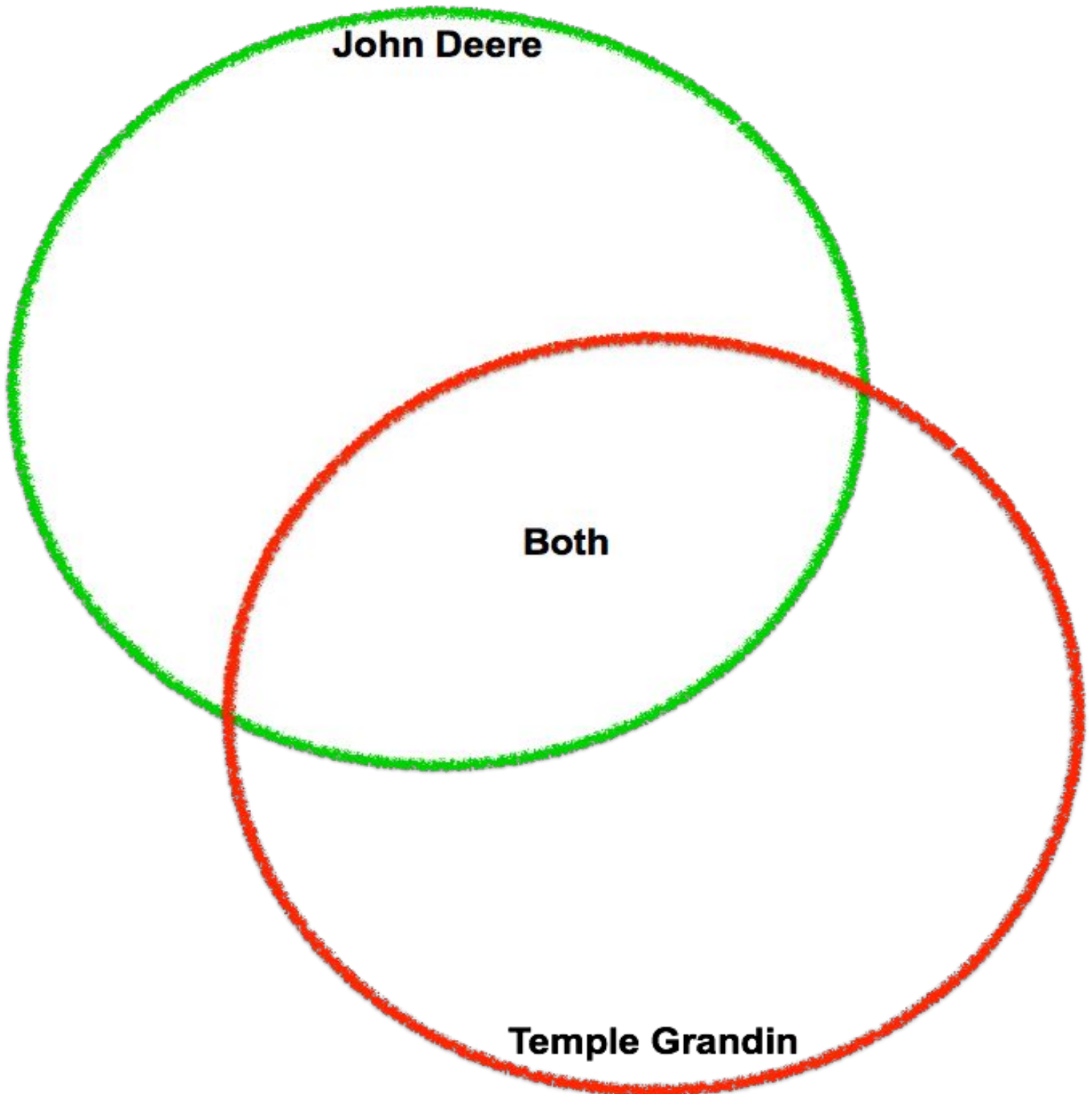
John was selling 100 plows a year. By 1850, his company was making about 1,600 plows a year. The company also made other farm tools.

When John Deere's son, Charles, became old enough, he ran the company. John Deere died on May 17, 1886.

Comparing Inventors Venn Diagram

Name: _____ Date: _____

Compare the lives of two agriculture inventors: John Deere and Temple Grandin. Use the top circle for John Deere and the bottom circle for Dr. Temple Grandin. Include ways they are alike in the center.



Cattle Flight Zones Comprehension Sheet

Name: _____ Date: _____

After reading “Cattle Flight Zones,” respond to the following questions. When making logical inferences, reference the text to support your answer.

1) What is the main idea of the “Cattle Flight Zones” reading page?

2) What details support the main idea?

3) Explain in your own words how to find the flight zone of cattle.

4) Do you think it would be easier to move calm cattle or cattle who are not used to people? Explain your answer.

5) Why would it be more difficult to move cattle in a pasture?

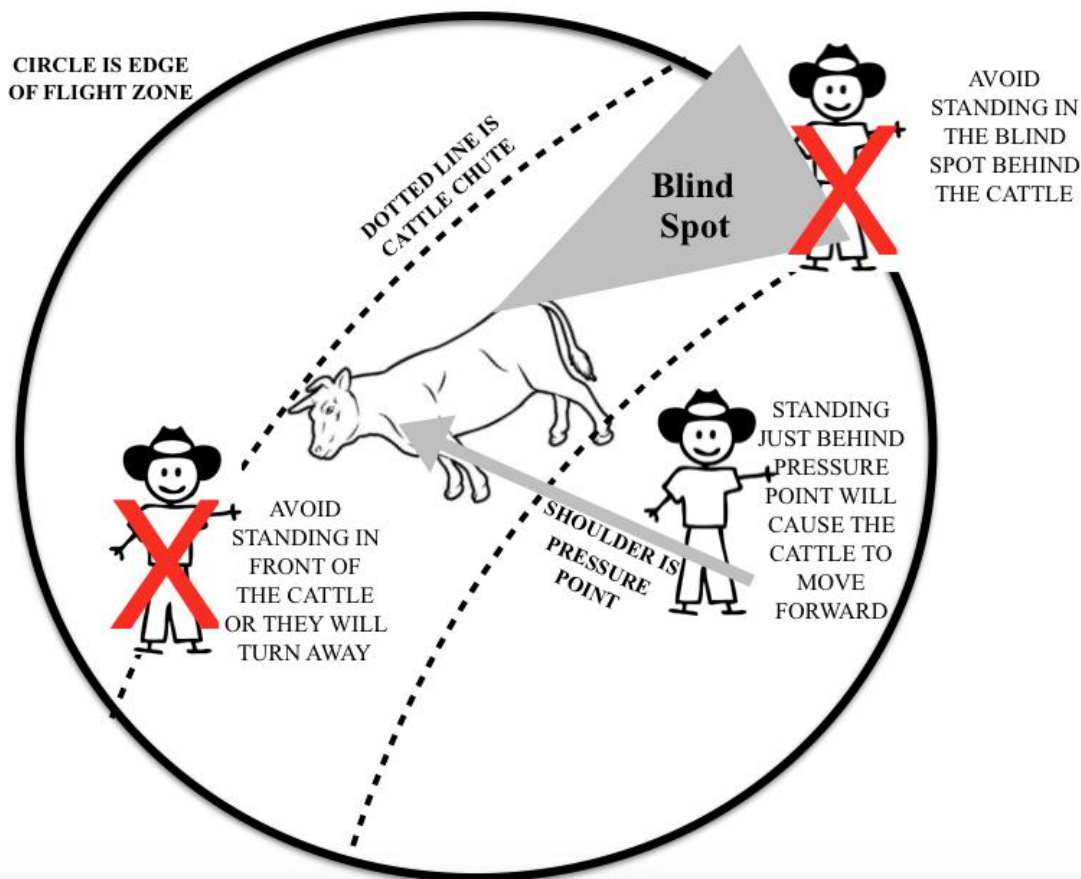


Cattle Flight Zones

Dr. Grandin talks to cattle owners about how to move cattle calmly. She teaches the owners how to know where the **flight zone** and **point of balance** are for the cattle. The flight zone is how far from the animal a person must stay to keep the animal calm. The picture below shows the flight zone and point of balance for cattle. For cattle, the point of balance is the shoulder. The outer circle is the edge of the flight zone. You can find the flight zone by slowly walking up to the animal. Walking up to an animal's head increases its flight zone. If a person is in the flight zone the animal will move away.

The dotted line represents a curved chute. A chute is an alleyway that people use to walk cattle to a pen. For most animals the point of balance is at their shoulder. When the handler stands at or behind the point of balance, the animal will move forward. They will back up if you stand in front of the shoulder. Avoid standing at the head of an animal and poking its rear. You should also not stand in the animal's blind spot, which is behind them. When a herd, or group, of cattle are moved in pastures and large pens, their behavior is usually different because they are not in a small pen. The flight zone may be different for a herd of cattle in pastures.

Calm livestock can be harder to move because they no longer have a flight zone. These animals can often be led using a halter or feed bucket. When animals are used to the person and the person stays calm, the animal learns to trust them.

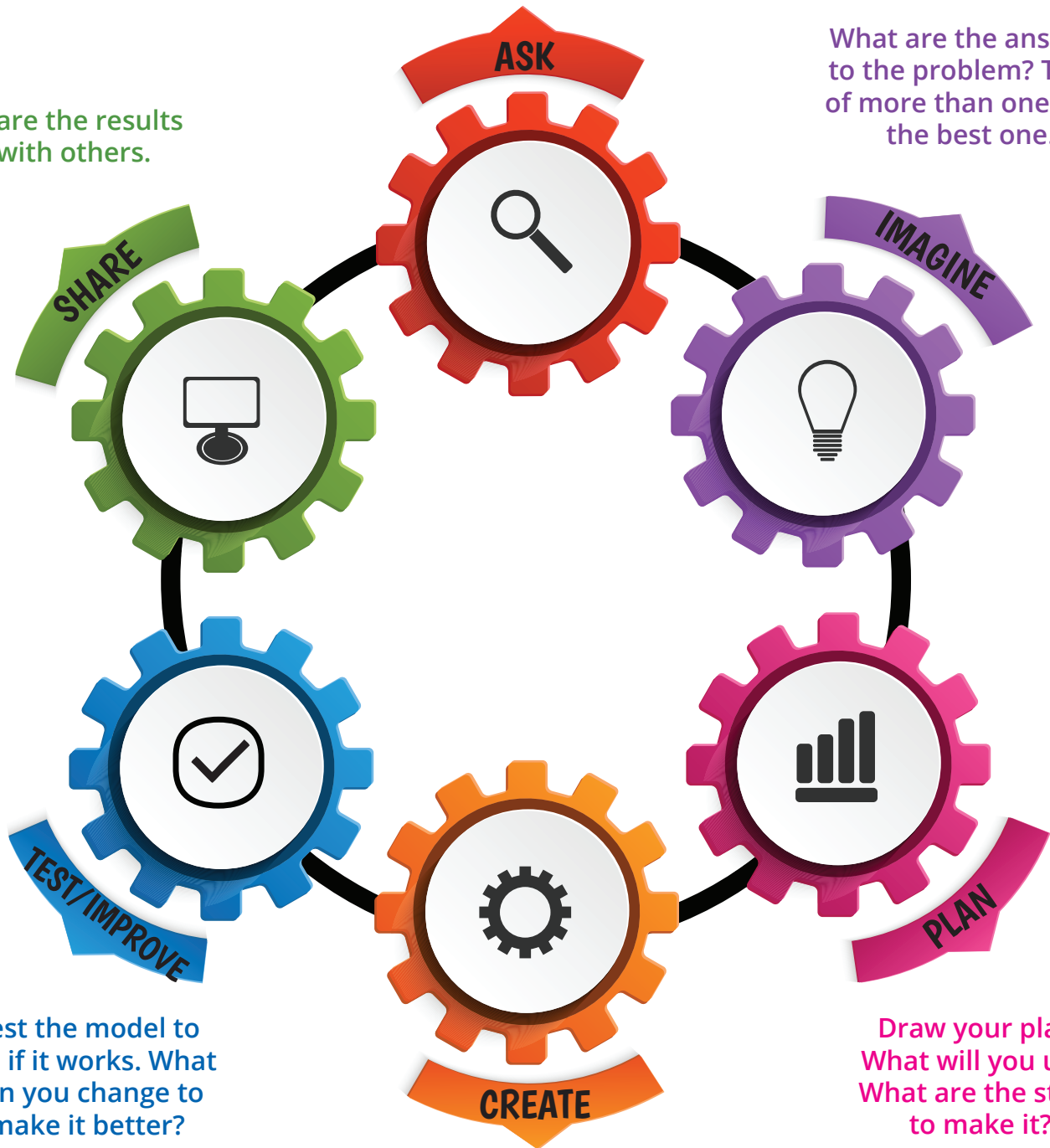


Engineering Process

What is the problem?

What are the answers to the problem? Think of more than one. Pick the best one.

Share the results with others.





what is the problem?

Think of solutions.



plan

Materials

steps



Test 1

Test 2

Did your plan work?

what can you change to make it better?