



Wally the Wrangler

Written by Will Jordan

Ag Literacy Project with FFA, 4-H & Volunteers

Lesson Plan (K-5, variations are adjusted to fit K-2 & 3-5 grade bands throughout the lesson plan)

NGSS Standards: Science

K-LS1-1; 1-LS1-1; 2-LS2-1; 3-LS4-3; 4-LS1-1;
5-PS3-1; 5-LS2-1

Book

Wally is a young cowboy who visits a working ranch with his friends, Mr. Squat and Mr. Jiggs. As he explores ranch life, Wally learns about caring for cattle, raising calves, the important role of horses on a ranch, and how ranchers responsibly steward natural resources. Along the way, readers discover where beef comes from and gain a better understanding of the people and practices involved in modern ranching. Through Wally's adventure, the book highlights agricultural literacy, sustainability, and the hard work that goes into producing food.

How the Project Works

Presenters read to students in K-5 classrooms and Complete hands-on activities with the students.
Suggested time: approximately 1 hour or longer if students have questions or comments. Can be broken into segments if needed.

Supplied Materials in Kit:

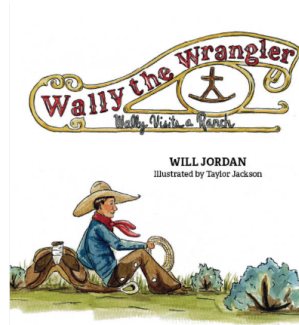
- 1 paperback book: Wally the Wrangler by Will Jordan
- 1 bag of green crinkle paper
- 5 paper funnels
- 20 quart-size bags
- 2 dehydrated sponges
- 1 club soda
- 1 grass-print tablecloth
- 1 set of nutrition cards
- 5 Pop Rocks candy bags
- 10 small cups for water and club soda
- 5 plastic spoons
- 10 paper towels
- 1 water bottle
- 25 brown pom-poms
- 1 long rope
- 1 Sharpie

Not supplied, but encouraged

- Crackers for the students and Jolly Ranchers for the review.

Materials Prep — Bag-by-Bag Setup

- **Quart Bag #1 — MOUTH:** Label MOUTH. Place a small cup beside it labeled SALIVA and fill 1/3 full with water.
- **Spoon — ESOPHAGUS:** Label the spoon ESOPHAGUS.
- **Quart Bag #2 — RUMEN:** Label RUMEN. Keep Pop Rocks beside the bag, ready to add.



Common Core Standards – ELA:

RI.K-5.1-4, 7 W.K-5.2, 8 SL.K-5.1, 2, 4

Common Core Standards –Math:

K.CC, K.MD; 1.MD, 1.OA; 2.MD, 2.OA;
3.MD, 3.OA; 4.MD; 5.MD, 5.NBT

Checklist

- ☐ Make sure you have ALL your supplies you need to present (PPT, complete Materials Kit, handouts (K-2 or 3-5), & eval form for the teacher to fill out).
- ☐ Give Teacher Evaluation Form BEFORE you start presenting.
- ☐ Ask the teacher to take photos (back of students only), and email those in to shaed@nmflb.org.
- ☐ Wait for the teacher to complete the eval form and take with you.
- ☐ Clean up presentation area.
- ☐ Have a great time & remember to smile!
- ☐ Scan/Email (shaed@nmflb.org) the Participation Form once you have completed all presentations.

- **Paper Funnel — RETICULUM:** Label the paper funnel RETICULUM.
- **Quart Bag #3 — OMASUM:** Label OMASUM. Place a paper towel inside.
- **Quart Bag #4 — ABOMASUM:** Label ABOMASUM. Place a small cup beside it labeled STOMACH ACID & DIGESTIVE JUICES and fill 1/3 full with club soda.
- **Quart Bag #5 — SMALL INTESTINE:** Label INTESTINES. Place cut sponge squares inside. Set the long rope around the room and place the nutrition cards along it.

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Part 1: Introduction and Recruit for Future Agriculturists (Time: 3-5 minutes)

1. Briefly introduce yourself and talk about your program (FFA/4-H/volunteer group).

Suggestion (Optional): *Visuals help! If you live on a farm or ranch, bring props! Ex: crop samples or photos of the farm equipment, buckles/ribbons/awards from FFA/4-H/volunteer activities.*

2. Discuss your connection to agriculture. Explain what FFA/4-H has done for you or what you look forward to doing through related volunteer activities. If you weren't involved in agriculture prior to FFA/4-H, share how your life still connects to agriculture (things you eat, where, and use every day).
3. Encourage students to consider joining FFA/4-H/volunteer group when they can! *Remind them they don't have to live on a farm or ranch to be in FFA/4-H – you just need to be interested in learning and willing to work hard!

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Part 2: What is Agriculture? (Time: 5-8 minutes)

Suggestion (Optional): *Bring examples of everyday products that come from agriculture or show pictures on PowerPoint.*

Say, "Today, we're going to be talking about this awesome word "AGRICULTURE". Has anyone ever heard or seen this word before? Raise your hand if you've ever heard of that word before.

"Okay - does anyone want to share what they think the word agriculture stands for?" ... Pause for sharing... If not, much is being shared, say, "That's okay if you don't know what it means because that's why we're here today. We're going to learn about it, right this very minute."

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- Ask students what they think agriculture means. Explain: Agriculture is the growth and production of plants and animals.
- Explain the two big categories: crops/plants and livestock/animals. To be considered livestock, animals provide a good or service.

Use the hamburger, T-shirt, toilet paper, and fuel examples. Students show thumbs up if agriculture helped provide the item and thumbs down if they think it did not.

- Hamburger: sesame, wheat, lettuce, tomato, onion, dairy for cheese, and cattle for beef all connect to agriculture.
- T-shirt: many shirts are made from cotton grown by farmers.
- Toilet paper: foresters grow and care for trees that become paper products.
- Fuel: ethanol can be made from corn and blended with gasoline.
- Ask students to share another way they have used agriculture today and identify whether it came from a plant or animal.

Part 3: Beef Cattle and Book Reading (Time: 10 minutes)

Introduce beef: beef is meat that comes from cattle. Explain that cattle also provide useful byproducts.

PRACTICE *reading the book before your class visit. Make it exciting and remember time yourself to keep a good pace!*

Introduce story. Ex: "Wally is a young cowboy who visits a working ranch with his friends, Mr. Squat and Mr. Jiggs. As he explores ranch life, Wally learns about caring for cattle, raising calves, the important role of horses on a ranch, and how ranchers responsibly steward natural resources.."

1. *Show off the great images in the book!*
2. *Timekeeper – Keep track of time.*
3. After the book is read, **if there is time, ask these questions.**

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- Explain a cow-calf operation: mother cows have calves, calves drink milk and grow with their mothers, and later transition to grass and hay.
- Review beef terminology: calf, heifer, cow, bull, and steer. Reinforce that all cattle can provide beef.
- Discuss the four natural resources crops and livestock need: soil, water, sun, and air.

BRAIN BREAK – Barnyard Run (Time: 5 minutes)

Get up, stretch, and follow along with the barnyard run!!! Presenters pick how long they want the brain break to be. There are 2 levels to the barnyard run.

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- Ask: “Can you eat grass for lunch? Why or why not?” Then ask, “What happens when a cow eats grass?”
- Explain that cows are ruminants—animals with a special stomach that helps digest plants. Cattle have one stomach with four compartments:
 - Rumen — breaks down plants with help from microbes. Motion: SQUISH.
 - Reticulum — catches larger food particles that need more chewing and helps form cud. Motion: CHEW.
 - Omasum — removes/absorbs water. Motion: SQUEEZE.
 - Abomasum — the “true stomach,” where acids and enzymes continue digestion. Motion: RUB BELLY.
- Introduce microbes as tiny living helpers in the rumen. Without microbes, cattle could not digest grass.

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Part 4: Moovin’ Through the Cow Activity (Time: 20 minutes)

Presenters have the choice to do it as a whole class or split students into groups. Each group uses the prepared bags and tools to act out the path of feed through a cow’s digestive system. Each group should have a group leader if splitting up.

Station 1 — Pasture / Mouth

1. Give each student a small amount of green crinkle paper to represent grass. If using a cracker, tell students not to eat it until directed.
2. Choose one student to be the cow and collect the “grass” into the MOUTH bag.
3. Add water from the cup labeled SALIVA and seal the bag.
4. Use fingers to mimic chewing and form the food into a wad. Students may now chew their cracker.

Ask: Have you ever tried chewing food without saliva? Why is saliva important?

Fun facts:

- Cows spend about 6–8 hours each day eating.
- A cow uses its rough tongue to wrap around grass and pull it into its mouth.
- Cows do not have top front teeth; they use a hard dental pad.
- A cow can produce up to about 50 gallons of saliva in a day.

Station 2 — Esophagus

- Use the spoon labeled ESOPHAGUS to move the wad of food from the mouth bag toward the rumen.
- Have students swallow once to connect the model to their own bodies.

Key idea: The esophagus transports food from the mouth to the stomach.

Station 3 — Rumen

- Place the food in the RUMEN bag.
- Add Pop Rocks to represent active rumen microbes and listen to the reaction.
- Seal the bag and gently lift and release the top of the bag to model a rumen contraction that mixes food, liquid, and microbes.

Ask: Who is really doing most of the work—the cow or the microbes?

Fun facts:

- The rumen is the largest stomach compartment.
- The rumen is home to billions of microbes.
- These microbes help cattle digest cellulose, the tough material in plant cell walls.

Optional movement: Squish an imaginary bag and call out “BUBBLE! FIZZ! BURP! SQUISH!”

Station 4 — Reticulum and Chewing the Cud

- Hold the paper funnel labeled RETICULUM over the opened OMASUM bag and pour the rumen contents through it.
- Show students that larger pieces are caught and need more chewing.
- Use the spoon/esophagus to “regurgitate” the wad back to the mouth.
- Have students pretend to chew cud for 10 seconds, moving jaws side to side.
- Lightly smash the food into smaller pieces, form it into a wad again, and move it toward the omasum.

Ask: Would you want to eat your lunch twice?

Fun facts:

- Food can travel from the rumen back to the mouth and then be swallowed again.
- The reticulum works like a sorting station and helps form cud.

Station 5 — Omasum

- Lay the food into the paper towel inside the OMASUM bag.
- Squeeze the paper towel to remove extra water.

Ask: Why do animals need water?

Fun facts:

- The omasum helps remove water from food before it moves on.
- Its folds look like pages in a book, so it is sometimes called the “book stomach.”

Optional movement: Stretch arms wide like a sponge, then squeeze arms tightly to the body three times.

Station 6 — Abomasum

- Carefully move the food into the ABOMASUM bag.
- Add a small amount of club soda from the cup labeled STOMACH ACID & DIGESTIVE JUICES.
- Explain that the abomasum works most like a human stomach and uses acidic liquids and enzymes to continue digestion.

Ask: What happens if your stomach does not digest food properly?

Fun facts:

- The abomasum is often called the “true stomach.”
- Calves rely heavily on this compartment while drinking milk.

Optional movement: Rub bellies in circles and make “GLURP” or “GURGLE” sounds.

Station 7 — Intestines and Nutrient Absorption

- Move the contents from the abomasum into the INTESTINES bag and add the sponge pieces.
- Explain that the sponge represents the small intestine absorbing remaining water and nutrients.
- Lay the long rope around the room to represent the intestines.
- Students slowly walk along the rope, collect nutrient cards, and do the pose shown on each card.

Ask: What nutrients help your body grow?

Fun facts:

- A cow’s intestines can be about 100–150 feet long.
- Nutrients move from the intestines into the bloodstream and support muscles, bones, energy, growth, and milk production.

Station 8 — Poop Happens!

- Give each student a brown pom-pom.
- Lay the grass-print tablecloth on the floor.

- Explain that after the cow uses the nutrients it needs, the remaining material becomes manure.
- Students toss their pom-poms onto the “grass.” Explain that manure returns nutrients to the soil and can act as a natural fertilizer.

Ask: What grows when manure adds nutrients back to the soil?

Fun facts:

- Cow manure contains nutrients plants need.
- Manure helps return nutrients to the soil.
- Healthy soil helps grow healthy crops.
- One cow can produce more than 50 pounds of manure in a day.

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Part 5: The Big Picture — Nutrient Cycle and Rangelands *(Time: 5–8 minutes)*

- Review the four stomach compartments in order: rumen, reticulum, omasum, abomasum.
- Connect the cycle: plants capture energy from the sun → cattle eat plants → cattle turn plants into nutrients and useful products → manure returns nutrients to soil → healthy soil grows more plants.
- Use the NRCS/rangeland slides to discuss how cattle, when managed carefully, can be part of a working rangeland system.

Key message: “In agriculture, everything is connected.”

Part 6: Can “MOO” Recall? *(Time: 5 minutes)*

- What are the four natural resources cattle need to survive?
- What is one way cattle help the rangeland?
- What are the four compartments of a ruminant’s stomach?
- What do cattle provide that helps plants grow?
- What do beef cattle produce for us?
- What is the most common type of cattle operation discussed for New Mexico?

REMINDERS – At the end of the presentation.

1. Ask if students have questions (Questions begin with a who, what, where, when, why, or how.).
2. Tell class that you will be leaving the “Wally the Wrangler” book in their teacher for them to check out later.
3. Thank the teacher and students for allowing you to visit their classroom and that you hope to see them again soon, and if they took any pictures (having only the backs of the students heads – for privacy/security) they can email those in to shaed@nmflb.org.

Resources & Other Helpful Links

Standards, Lessons, and Educational Resources

- K-2: Milk or Meat? Beef or Dairy?- <https://newmexico.agclassroom.org/matrix/lessons/267/>
- K-2: Animals on the Farm - <https://newmexico.agclassroom.org/matrix/lessons/861/>
- 3-5: Beef Basics- <https://newmexico.agclassroom.org/matrix/lessons/284/>
- 3-5: Build a Calf- <https://newmexico.agclassroom.org/matrix/lessons/529/>
- And many more! Check out our website – www.nmaitc.org
- “Farm Animal Life Cycles” <https://newmexico.agclassroom.org/matrix/lesson/81/>
- Rangeland Plants – NM <https://pubs.nmsu.edu/circulars/CR374/index.html>
- Making a Brand for Ourselves the Cowboy Way- <https://newmexico.agclassroom.org/matrix/lessons/527/>
- Caring for the Land- <https://newmexico.agclassroom.org/matrix/lessons/136/>
- Right this Very Minute- <https://newmexico.agclassroom.org/matrix/lessons/702/>
- Roll of the Genes- <https://newmexico.agclassroom.org/matrix/lessons/119/>

Helpful Hints Before Your Classroom Visit

- Wear official dress. It looks sharp and promotes FFA/4-H.
- Practice, practice, practice! Prepare by reading book and practicing activity. You want to fit your presentation and activity within the time scheduled. Teachers have very busy schedules so please try to stick to your allotted time.
- Check in with the teacher. If possible, before your presentation, briefly visit with the teacher. Share a copy of the activity and ask if there are students that need special accommodations.
- Can everyone see and hear? Before you start reading, make sure all the students can see and hear the book so they will be good listeners.
- Move the book close to the screen as you read. Either while you are reading, or after reading each page, move the book in close so each student can see the great images. This is especially important with younger grades.
- Pay close attention to the students' mood. Move along fast enough to maintain student's interest, but slow enough for all students to thoroughly enjoy the story.
- Most importantly, have fun! Enjoy this wonderful experience of reading aloud and teaching children about the importance of agriculture.

QUESTIONS:

Contact New Mexico Ag In the Classroom with any questions you may have on the Ag Literacy Project or to request a training session.

Shae Devers, Senior Program Coordinator, shaed@nmflb.org
Visit www.nmaitc.org for free additional lessons and resources.

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