Meet Extension Agent
Dessa Watson

Dessa Watson is the 4-H/ Youth Development Extension Agent for Rio Blanco County. She has a B.S. from Colorado State University in Agriculture Education with a concentration in Agriculture Extension Education, and an M.A. from CSU in Agriculture Extension Education. Prior to working in Extension, Dessa was a Graduate Teaching Assistant, Riding Instructor, FFA Intern Advisor, and a 4-H Horse & Livestock Intern.

Dessa loves working in Extension as it provides a great opportunity to work creatively, meet new people, and to spend time with the youth in the community. Her work allows Dessa to integrate her personal interests and passions into her programs. She enjoys incorporating her love of horses by working with 4-H'ers in all aspects of horse projects.

Dessa believes the Horse project is great year round for horse crazy youth! The Colorado 4-H Horse project offers the equine enthusiasts ways to improve horsemanship, expand equine knowledge, and develop great record keeping skills! For the avid horse lovers who do not have a horse, there is the Horseless Horse project where youth learn all they need for their own a horse one day!

Dessa loves living in NW Colorado with her husband Brett and beautiful baby boy Whit Thomas. She enjoys time at home with her family and all the critters of her "funny farm", especially "Little John," her sweet pet sheep. Dessa's riding goal for this winter is to get her green horses going and to master the art of team roping so she can rope with her husband!

STEM Connections

Colorado State University Extension

Connecting Science, Technology, Engineering, and Math concepts to our everyday lives.

The First Movie Ever Made

To answer the age-old question: When trotting or galloping, do all four horse hooves leave the ground?

Eadweard James Muybridge was an English photographer who immigrated to the USA. Muybridge is famous for shooting film of animal locomotion, which used multiple cameras to capture motion in stop-action photographs, and his **zoopraxiscope**, a device that predated the film strips used in cinematography today.

In 1872, the former governor of California Leland Stanford, a businessman, race-horse owner, and founder of Stanford University, hired Eadweard Muybridge to proven **scientifically** whether all four feet of a horse were off the ground at the same time in a **trot** and **gallop**. The human eye cannot determine the action fast actions like trotting or galloping. At that time, artists painted horses at a trot with one foot always on the ground and at a full gallop with the front legs extended forward and the hind legs extended to the rear, and all feet off the ground. Stanford disagreed.

Muybridge settled Stanford's question with a single photographic negative showing his Standard bred trotting horse *Occident* airborne at the trot. This negative was lost. Stanford also wanted a study of the horse at a gallop. Muybridge placed numerous large glass-plate cameras in a line along the edge of the track; the shutter of each was triggered by a thread as the horse passed, and the path was lined with cloth sheets to reflect as much light as possible. He copied the images in the form of silhouettes onto a disc to be viewed in a machine he had invented, which he called a zoopraxiscope. This device was later regarded as an early movie projector, and the process as an intermediate stage toward motion pictures or cinematography.

The study is called *Sallie Gardner at a Gallop* or *The Horse in Motion* (photo above); it shows images of the horse with all feet off the ground. This did not take place when the horse's legs were extended to the front and back, as imagined by contemporary illustrators, but when its legs were collected beneath its body as it switched from "pulling" with the front legs to "pushing" with the back legs.

EXPLORE IT - DESIGN IT - DO IT

Directions:

- You are going to make your own movie of The Horse in Motion (although from later photographs) in flip book form.
- Carefully cut the pictures along the dotted lines, being sure to leave the white strip on the left of each photo (with 2 "X" and the number of the photo in the series). Note, the more evenly and carefully you cut out each photo, the better your flip book will work.
- Order the pages from the title page to photograph #19.
- If you use a heavy duty stapler, staple at each "X." If you use a binder clip, clip along the left edge.
- Bend the book backwards, and allow the pages to flip with your thumb controlling the speed.

Flipbooks

Age Appropriate:
4th—HS grades

Time Required:
45 minutes

Materials:
- Computer and printer
- white copy paper
- Optional: card stock paper
- Scissors
- Binder clip or heavy duty stapler

The Set-up:
- Download Gallop and Trot http://www.coopext.colostate.edu/tra4h/stem.htm
- Print
- Gather materials

The Clean-up:
- Recycle scrap paper
- Put away scissors/stapler

Power Words
- **flipbook**: small book consisting of a series of images that give the illusion of continuous movement when the edges of the pages are flipped quickly
- **gallop**: A natural three-beat gait of a horse, faster than a canter, in which all four feet are off the ground at the same time during each stride.
- **scientifically**: employing the methodology of science (asking a testable question, designing an experiment to answer that question, setting a hypothesis—collecting and analyzing data, drawing conclusions—communicating these data, and adding benefit to humanity)
- **trot**: The gait of a horse or other four-footed animal, between a walk and a canter in speed, in which diagonal pairs of legs move forward together.
- **zoopraxiscope**: early device for displaying motion pictures, created Eadweard Muybridge in 1879

Photo Credits:
Dessa Watson by Brett Watson
Horse galloping—http://en.wikipedia.org/wiki/Sallie_Gardner_at_a_Gallop