

2 How Kansas Animals Grow

Class Introduction

Activity 1: Animal Growth and Development

Worksheet a: Baby Animal Cards

Worksheet b: Mature Animal Cards

Activity 2: Beekeeping

Activity 3: Pasture Game

Worksheet a: Recording Chart

Activity 3: Good Feed

Worksheet a: Figuring the Feed Label

Activity 4: Weather

Worksheet a: Pinwheel Template

Worksheet b: Weather Log

Evaluation: Student Worksheet

What I Know About How Kansas Animals Grow

OUTCOMES

The students will

- Recognize weights of young and mature animals.
- Discover that bees use scent to locate and protect their beehives.
- Estimate the food needs of animals.
- Recognize that food is scarce.
- Understand animal management with respect to reproduction and marketing.
- Determine the similarities and differences between categories of human diets and animal feed rations, package and label a product.
- Discover that the weather changes daily.
- Observe weather conditions.

Educator Introduction

Animals, just like plants, require a few items for proper growth and development. They must have just the right components in the proper amounts: water, food, shelter and adequate space. These components form the animal's habitat.

Domestic animals depend on humans for their habitat components. Farmers and ranchers provide sources for water, food, shelter and space for the animals they raise. In addition the land that is owned by farmers and ranchers is also the habitat for wild animals. Much of the crop and pasture land in Kansas is home to diverse species of wild animals in addition to housing the domestic animals that humans depend on for food.

When all the components of habitat are adequate, animals will grow to maturity. At maturity, animals are able to reproduce to ensure the survival of their species. Reproduction happens differently for all types of animals: mammals, reptiles, insects and birds.

In this unit students will learn how the habitat components of food, water, shelter and space come together for Kansas livestock and wild animals.

Resources

RESOURCE BOOKS

- *Teachers and Advanced Readers
- Atwell, Debby. *Barn*. Houghton Mifflin Co., 2001 (0618153160) (1996, 0395785685)
- Barnes, Julia. *Farm Animals*. Gareth Stevens Audio, 2002. (0836830393)
- Bial, Raymond. *Portrait of a Farm Family*. Houghton Mifflin Co., 1995. (0395699363)
- Brown, Margaret Wise. *Big Red Barn*. HarperCollins Children's Books, 1999. (0060207493) (1991, 0060207507) (1989, 0060207485) With cassette — 1998. (0694700975) Spanish — (1996, 0060262257)
- Dahl, Michael. *Do Cows Eat Cake?: A Book about what Animals Eat*. Picture Window Books, 2003. (1404801014)
- Everett, Felicity. *The Usborne Book of Farm Animals*. EDCP, 1993. (0881106488)
- Haas, Jessie. *Hurry!* Greenwillow Books, 2000. (0688168892)
- High, Linda Oatman. *Barn Savers*. Boyd Mills Press, 1999. (1563974037)
- Jacobsen, Karen. *Farm Animals*. Children's Press, 1981. (0516016199)
- Kalman, Bobbie D. *In the Barn*. Crabtree Publishing Co., 1996. (0865054339) (0865054630)
- Lesser, Carolyn. *What a Wonderful Day to Be a Cow*. Random House Children's Books, 1999. (0375802126)
- Lindbergh, Reeve. *Midnight Farm*. Dial Books for Young Readers, 1987. (0803703317)
- Longnecker, Theresa. *Who Grows Up on the Farm?: A Book about Farm Animals and their Offspring*. Picture Window Books, 2002. (1404800298)
- McPhail, David M. *Farm Morning*. Harcourt, 1991. (015227300X) Econo-Clad Books, 1991. (0833573977)
- Patterson, Geoffrey. *The Story of Hay*. Farming Press Limited, 1996. (0852363249)
- Pluckrose, Henry Arthur. *On the Farm*. Scholastic Library Publishing, 1999. (0531153525) (1998, 0531144968)
- Richards, Jon. *Farm Machines*. Millbrook Press, 1999. (0761309063) Includes cutaway view of round hay baler.
- Sandemann, Anna. *Bones*. Millbrook Press, 2002. (0761318496) (1997, 1562946218)
- Stone, Lynn M. *Animals de Granja: Farm Animals*. (Spanish) Rourke Enterprises, Inc., 1991. (0865929483)
- Stone, Lynn M. *Farm Animal Discovery Library*. Rourke Corporation, 1990. (0865930333)
- . *Farm Animals*. Rourke Publishing, LLC, 2002. (1589520904)
- Tuxworth, Nicola. *Farm Animals*. Gareth Stevens Audio, 1999. (0836822714)
- van Eerbeek, Ton, ed. *The World of Farm Animals: An Early Encyclopedia for Beginning Readers*. Sterling Publishing Co., Inc., 2002. (0806984619)
- *Walker, Richard. *The Visual Dictionary of the Skeleton*. D.K. Publishing, Inc., 1995. (0789401355)
- Watson, Mary G. *Feeds and Feeding*. Half Hat Press, 1988. (187208253X)

BEEKEEPING

- Cole, Joanna and Bruce Degen. *The Magic School Bus: Inside a Beehive*. Scholastic, Inc., 1997. (0590257218) Teacher Created Materials, 1997. (1576901378)
- Gibbons, Gail. *Honey Makers*. Harper Collins Children's Books, 2000. (0688175317)
- Heilingman, Dorothy. *Honeybees*. National Geographic Society, 2002. (0792266781)

Heller, Ruth. *The Reason for a Flower*. Penguin Putnam Books for Young Readers, 1999. (0698115597) Econo-Clad Books, 1999. (0833590006) The Putnam Publishing Group, 1983. (0448144956) Spanish — Editorial Grijalbo. (9684199597)

High, Linda Oatman. *Beekeepers*. Boyd Mills Press, 2002. (1590780469) (1998, 156397486X)

Hogan, Paula Z. *The Life Cycle of the Honeybee*. Raintree Publishers, 1995. (0811481794)

Krebs, Laurie. *The Beeman*. Simon and Schuster Adult Publishing Group, 2002. (0792272242)

Micucci, Charles. *The Life and Times of the Honeybee*. Houghton Mifflin Co., 1997. (039586139X) Econo-Clad Books, 1997. (0613053664)

CATTLE — BEEF AND DAIRY

Bell, Rachael. *Cows*. Heinemann Library, 2001. (1588103684) (2000, 1575725290)

Butterfield, Moira. *Cow*. Thameside Press, 2000. (1929298897)

Chase, Edith Newlin. *The New Baby Calf*. Spanish — Scholastic, Inc. 1991. (0590447769) English — Scholastic, Inc. 1986. (0590404571)

Doudna, Kelly. *Calves*. ABDO Publishing Co., 1999. (1577651863)

Flanagan, Alice K. *Raising Cows on the Koebel's Farm*. Scholastic Library Publishing, 1999. (0516264702)

Klingel, Cynthia Fitterer. *Cows, Vol. 2*. The Child's World, Inc., 2001. (1567668208)

Miller, Heather. *My Cows*. Scholastic Library Publishing, 2000. (051623031X) (0516231065)

Miller, Sara Swan. *Cows*. Scholastic Library Publishing, 2000. (0516215779)

Older, Jules. *Cow*. Charlesbridge Publishing, Inc., 1998. (0881069566) (1997, 0881069574)

Powell, Jillian. *From Calf to Cow*. Raintree Publishers, 2002. (0739844261)

Schertle, Alice. *How Now, Brown Cow?* Harcourt, 1998. (0152017062)

Stone, Lynn M. *Cows*. Rourke Publishing Co., 1990. (0865930392) Spanish — Rourke Enterprises, Inc., 2002. (0865929521)

—. *Cows Have Calves*. Compass Point Books, 2000. (075650001X)

Trumbauer, Lisa. *Life Cycle of a Cow*. Capstone Press, 2002. (0736814515)

Wolfman, Judy. *Life on a Cattle Farm*. Lerner Publishing Group, 2001. (1575055163)

GOATS

Buck, Gisela and Siegfried. *Billy and Bonnie the Goats*. Gareth Stevens Audio, 1997. (0836815084)

Cooper, Jason. *Goats*. Rourke Publishing, LLC, 1995. (1559160934)

McBrier, Page. *Beatrice's Goat*. Simon and Schuster Children's, 2001. (0689824602)

Miller, Heather. *My Goats*. Scholastic Library Publishing, 2000. (0516231073) (0516230328)

Miller, Sara Swan. *Goats*. Scholastic Library Publishing, 2000. (0516215787) (0516271822)

Murray, Julie. *Goats*. ABDO Publishing Co., 2002. (1577657004)

Wolfman, Judy. *Life on a Goat Farm*. Lerner Publishing Group, 2001. (1575055155)

HORSES

Ammon, Richard. *Amish Horses*. Simon and Schuster Children's, 2001. (0689826230)

Barnes, Julia. *101 Facts about Horses and Ponies*. Gareth Stevens Audio, 2002. (0836830199)

Bell, Rachael. *Horses*. Heinemann Library, 2001. (158810365X) (2000, 1575725312)

Budd, Jackie. *The Best Book of Ponies*. Houghton Mifflin and Co., 1999. (0753451727)

Butterfield, Moira. *Horse*. Thameside Press, 2000. (1929298900)

Resources

- Doudna, Kelly. *Foals*. ABDO Publishing, 1999. (1577651839)
- Driscoll, Laura. *Horses: An Abridgment of Harold Roth's Big Book of Horses*. The Putnam Publishing Group, 1997. (0488417359)
- Feldman, Jane. *I Am a Rider*. Random House, Inc., 2000. (0679886648) (0679986642)
- Fowler, Allan. *Horses, Horses, Horses*. Scholastic Library Publishing, 1992. (0516449214) (0516049216)
- Gaff, Jackie. *I Wonder Why Horses Wear Shoes: And Other Questions About Horses*. Houghton Mifflin Co., 2002. (0753454475)
- Gammie, Janet L. *Arabian Horses*. ABDO Publishing, 1996. (1562394401)
- . *Clydesdale Horses*. ABDO Publishing, 1996. (156239441X)
- . *Palomino Horses*. ABDO Publishing, 1996. (1562394428)
- . *Pinto Horses*. ABDO Publishing, 1996. (1562394398)
- . *Shetland Horses*. ABDO Publishing Co., 1996. (156239438X)
- . *Thoroughbred Horses*. ABDO Publishing Co., 1996. (1562394371)
- GaWaNi Pony Boy. *Out of the Saddle: Native American Horsemanship*. Bow Tie Press, 1998. (1889540374)
- Gentle, Victor. *Appaloosas*. Gareth Stevens Audio, 2001. (0836821297)
- . *Chincoteague Ponies*. Gareth Stevens Audio, 2001. (0836829352)
- . *Florida Cracker Horses*. Gareth Stevens Audio, 2001. (0836829360)
- . *Miniature Horses*. Gareth Stevens Audio, 2001. (0836829379)
- . *Morgans*. Gareth Stevens Audio, 2001. (0836821300)
- . *Mustangs*. Gareth Stevens Audio, 2001. (0836821319)
- . *Paints and Pintos*. Gareth Stevens Audio, 2001. (0836821327)
- . *Palominos*. Gareth Stevens Audio, 2001. (0836821335)
- . *Quarter Horses*. Gareth Stevens Audio, 2001. (0836821343)
- . *Saddlebreds*. Gareth Stevens Audio, 2001. (0836829387)
- . *Standardbreds*. Gareth Stevens Audio, 2001. (0836829395)
- . *Tennessee Walking Horses*. Gareth Stevens Audio, 2001. (0836829409)
- . *Thoroughbreds*. Gareth Stevens Audio, 2001.
- Hansard, Peter. *Field Full of Horses*. Candlewick Press, 2001. (0763614343) Econo-Clad Books, 2001. (0613442075)
- Henderson, Carolyn. *DK Horse and Pony Book*. DK Publishing, Inc., 2002. (0789485117)
- . *Horse and Pony Breeds*. DK Publishing, Inc., 1999. (0789442671) Econo-Clad Books, 1999. (0613172868)
- . *Horse and Pony Shows and Events*. DK Publishing Co., Inc., 1999. (0789442655)
- High, Linda Oatman. *Winter Shoes for Shadow Horse*. Boyd Mills Press, 2001. (156397472X)
- Kalman, Bobbie. *Horses*. Crabtree Publishing Co., 1995. (0865057230) (0865056234)
- Meadows, Graham. *Horses*. Gareth Stevens Audio, 1998. (0836822536)
- Nelson, Robin. *From Foal to Horse*. Lerner Publishing Group, 2002. (0822509415)
- Peterson, Cris. *Horsepower: The Wonder of Draft Horses*. Boyd Mills Press, 2001. (1563979438) (1997, 1563976269) Econo-Clad Books, 2001. (0613423852)

- Petty, Kate. *Horse Heroes: True Stories of Amazing Horses*. DK Publishing, Inc., 1999. (0789440016)
- Pleasant Company Publications. *Girls and Their Horses: True Tales from American Girls*. Pleasant Company Publications, 2000. (1584850396)
- Posell, Elsa. *Horses*. Scholastic Library Publishing, 1981. (0516016237)
- Pritchard, Louise. *My Pony Book*. DK Publishing, Inc., 1998. (0789428105)
- Ransford, Sandy. *Horses and Ponies*. Houghton Mifflin Co., 2001. (0753453436) Barron's Educational Series, Inc., 1996. (0812065883)
- Schuh, Mari C. *Horses on the Farm*. Capstone Press, 2002. (0736811893)
- Schwartz, David M. *Horse*. Gareth Stevens Audio, 2001. (0836829743) Spanish — (0836829913)
- Stone, Lynn M. *Appaloosas*. Rourke Publishing, LLC, 1998. (0865935106)
- . *Clydesdales*. Rourke Publishing, LLC, 1998. (0865935114)
- . *Horses*. Rourke Publishing, LLC, 1990. (086593035X)
- . *Horses Have Foals*. Compass Point Books, 2000. (0756500028)
- . *Lipizzans*. Rourke Publishing, LLC, 1998. (0865935122)
- . *Read All About: Horses*. Rourke Publishing Group, 1998. (0865935092)
- . *Quarter Horses*. Rourke Publishing, LLC, 1998. (0865935149)
- . *Thoroughbreds*. Rourke Publishing, LLC, 1998. (0865935157)
- . *Wild Horses*. Rourke Publishing, LLC, 1998. (0865935130)
- Wolfman, Judy. *Life on a Horse Farm*. Lerner Publishing Group, 2001. (1575055171)
- POULTRY — CHICKENS, DUCKS AND TURKEYS**
- Back, Christine and Jens Olesen. *Chicken and Egg*. Silver Burdett Press, 1989. (0382092848)
- Bell, Rachael. *Chickens*. Heinemann Library, 2001. (1588103676) (2000, 1575725304)
- . *Turkeys*. Heinemann Library, 2000. (1575725347)
- Brady, Peter. *Chickens*. Capstone Press, 1996. (1560653477) Spanish — (1999, 1560657871)
- Burton, Jane. *Chick*. DK Publishing, Inc., 2001. (0789476541)
- Fowler, Allan. *The Chicken or the Egg?* Scholastic Library Publishing, 1993. (0516460080) (0516496395) (051660082)
- . *Quack and Honk*. Scholastic Library Publishing, 1994. (0516560123) (1993, 0516060120) Spanish — (1993, 05163060124)
- Gibbons, Gail. *Chicks and Chickens*. Holiday House, Inc., 2003. (082341700X)
- . *Ducks*. Holiday House, Inc., 2001. (0823415678)
- Goldin, Augusta R. *Ducks Don't Get Wet*. Harper Collins Children's Books, 1999. (006451879) (006027882X) Econo-Clad Books (0833546368)
- James, Susan. *Amazing Egg*. Compass Point Books, 2002. (075650225X)
- Ketchersid, Sarah. *Watch Me Grow: Chick*. Penguin Putnam books for Young Readers, 2000. (0525463615)
- Nelson, Robin. *From Egg to Chicken*. Lerner Publishing Group, 2003. (0822546620) (0822547333)
- Patent, Dorothy Hinshaw. *Wild Turkeys*. Lerner Publishing Group, 1999. (0822530260)
- Powell, Jillian. *From Chick to Chicken*. Raintree Publishers, 2002. (073984427X)
- Royston, Angela. *Life Cycle of a Chicken*. Heinemann Library, 2001. (157572474X)

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Saunders-Smith, Gail. *Chickens*. Capstone Press, 1997. (156065483X)

Schwartz, David M. *Chicken*. Gareth Stevens Audio, 2001. (0836829719) Spanish — (0836829964)

Selsam, Millicent Ellis. *Egg to Chick*. Econo-Clad Books, 1987. (0833519182) HarperCollins Children's Books, 1987. (006444113X)

Stone, Lynn M. *Chickens*. Rourke Publishing, LLC, 1990. (0865930341) Spanish — Rourke Enterprises, Inc., 2002. (0865929491)

—. *Ducks*. Rourke Corporation, Inc., 1990. (0865930368) Spanish — Rourke Enterprises, Inc., 2002. (086592953X)

Trumbauer, Lisa. *Life Cycle of a Chicken*. Capstone Press, 2002. (0736811834)

Watts, Barrie. *Duck*. DK Publishing, Inc., 2001. (078947655X)

SHEEP

Bell, Rachael. *Sheep*. Heinemann Library, 2000. (1575725339)

Brady, Peter. *Sheep*. Capstone Press, 1996. (1560653469) Spanish — (1999, 1560657901)

Carrick, Carol. *Valentine*. Houghton Mifflin Co., 2001. (0618051511) (1993, 039566554X)

Hansen, Ann Larkin. *Sheep*. ABDO Publishing Company, 1998. (1562396064)

Kalman, Bobbie D. *Hooray for Sheep Farming!* Crabtree Publishing Co., 1997. (0865056692) (0865056552)

McGinty, Alice B. *Shepherding Dogs: Rounding up the Herd*. The Rosen Publishing Group, Inc., 1999. (0823952193)

Miller, Heather. *My Sheep*. Scholastic Library Publishing, 2000. (0516231103) (1516230352)

Murray, Peter. *Sheep*. The Child's World, Inc., 1997. (1567663796)

Powell, Jillian. *From Lamb to Sheep*. Raintree Publishers, 2002. (0739844253)

Stone, Lynn M. *Sheep*. Rourke Publishing, LLC, 1990. (0865930384) Spanish — Rourke Enterprises, Inc., 2002. (0865929157)

—. *Sheep Have Lambs*. Compass Point Books, 2000. (0756500044)

SWINE

Bell, Rachael. *Pigs*. Heinemann Library, 2001. (1588130668) (2000, 1575725320)

Brady, Peter. *Pigs*. Children's Press, 1998. (0516201174) Capstone Press, 1996. (1560653450) Spanish — (1560657898).

Butterfield, Moira. *Pig*. Thameside Press, 2000. (1929298919)

Doudna, Kelly. *Piglets*. ABDO Publishing Co., 1999. (1577651855)

Gibbons, Gail. *Pigs*. Holiday House, Inc., 2000. (0823415546) (1999, 0823414418)

King-Smith, Dick. *All Pigs Are Beautiful*. Candlewick Press, 2001. (0763614335) Econo-Clad Books, 2001. (0613358945)

Meadows, Graham. *Pigs*. Gareth Stevens Audio, 1998. (0836822544)

Murray, Julie. *Pigs*. ABDO Publishing Co., 2002. (1577656482)

Murray, Peter. *Pigs*. The Child's World, Inc., 1997. (1567663788)

Powell, Jillian. *From Piglet to Pig*. Raintree Publishers, 2002. (0739844288)

Stone, Lynn M. *Pigs*. Rourke Publishing, LLC, 1990. (0865930376) Spanish — Rourke Enterprises, Inc., 2002. (0865929890)

—. *Pigs Have Piglets*. Compass Point Books, 2000. (0756500036)

Wolfman, Judy. *Life on a Pig Farm*. Lerner Publishing Group, 2001. (1575052369)

WEB SITES AND OTHER RESOURCES**GENERAL**

Alfalfa Pellets — Alfalfa Processors Council,
www.aapausa.org/pellets.htm

Animal Photos — Image Gallery — Agricultural
 Research Service, USDA, [www.ars.usda.gov/is/
 graphics/photos/](http://www.ars.usda.gov/is/graphics/photos/)

Animal Resources (Links) — The Electronic Zoo,
netvet.wustl.edu/ssi.htm

Animal Tracks — Wild Kingdom,
www.wildkingdom.com/kids_zone/tracks/

Animal Worksheets — Kansas Agri Women,
www.ksagriwomen.org/education.html

Animals and Their Tracks, www.bear-tracker.com/

Barnyard Palace — North Carolina State University
 Veterinary Medicine College, (Beef, Dairy, Horses,
 Pigs, Goats, Poultry — Turkeys and Chickens, Sheep
 and Milking Parlor), [www.agr.state.nc.us/cyber/
 kidswrld/general/barnyard/barnyard.htm](http://www.agr.state.nc.us/cyber/kidswrld/general/barnyard/barnyard.htm)

Breeds of Livestock — Dept. of Animal Science,
 Oklahoma State University, (Cattle, Goats, Horses,
 Sheep, Swine and Poultry), [www.ansi.okstate.edu/
 breeds/](http://www.ansi.okstate.edu/breeds/)

Images (Flowers, Pollinators, Etc.) — Oklahoma
 Alfalfa, [alfalfa.okstate.edu/database/images/
 imagedata.htm](http://alfalfa.okstate.edu/database/images/imagedata.htm)

Photos of Alfalfa, etc. — National Honey Board,
www.honeylocator.com, Locate Honey>By
 Location>State (Kansas)>Learn More

ANIMAL CARE

American Veterinary Medical Association,
www.avma.org/careforanimals/default.asp

CyberSpace Farm — Kansas Women Involved in
 Farm Economics, (Beef, Dairy, Pigs, and Sheep),
www.cyberspaceag.com

Distiller's Dried Grains Information — American
 Coalition for Ethanol, [www.ethanol.org/
 Distiller_Dried_Grains_Info.htm](http://www.ethanol.org/Distiller_Dried_Grains_Info.htm)

Distiller's Dried Grains with Solubles, General
 Information — University of Minnesota,
www.ddgs.umn.edu/general-info.htm

Farmers Care for America's Farm Animals —
 American Farm Bureau, [www.fb.com/brochures/
 farmerscare/](http://www.fb.com/brochures/farmerscare/)

4-H Virtual Farm — Virginia Cooperative
 Extension, (Horses, Beef Cattle, Dairy Cattle,
 Poultry, Watch a Chick Hatch and more),
[www.ext.vt.edu/resources/4h/virtualfarm/
 main.html](http://www.ext.vt.edu/resources/4h/virtualfarm/main.html)

The Humble Soybean (history of soybean industry)
 — American Soybean Association, [66.201.71.163/
 soyindustry/index.htm](http://66.201.71.163/soyindustry/index.htm)

Livestock Facts Cards — Nebraska Agriculture in
 the Classroom,
 Beef Cattle — www.fb.com/nefb/ag-ed/beef.html,
 Dairy Cattle — [www.fb.com/nefb/ag-ed/
 dairy.html](http://www.fb.com/nefb/ag-ed/dairy.html),
 Poultry — www.fb.com/nefb/ag-ed/poultry.html,
 Sheep — www.fb.com/nefb/ag-ed/sheep.html,
 Swine — www.fb.com/nefb/ag-ed/swine.html

The Many Uses of Corn, What Can You Get from a
 Bushel of Corn? — Kansas Corn Growers
 Association, www.ksgrains.com/corn/edu.html

On Line Photography Center — U.S. Dept. of
 Agriculture, (Includes cattle, goats, horses, poultry,
 sheep and swine), [www.usda.gov/oc/photo/opc-
 anim.htm](http://www.usda.gov/oc/photo/opc-anim.htm)

Project TEACH — Texas Dept. of Agriculture,
[www.agr.state.tx.us/education/teach/
 index.htm#Lessons](http://www.agr.state.tx.us/education/teach/index.htm#Lessons), Natural Fibers — Cotton,
 Wool, Mohair and Leather, Dairy — Dairy Goats,
 Dairy Cattle and Dairy Products, Beef History and
 Nutrition, Food Safety, Pork, Cattle Trails Map
 (Includes Kansas)

Protecting a Healthy Food Supply — Animal
 Health Institute, [www.ahi.org/protecting/
 index.asap](http://www.ahi.org/protecting/index.asap)

Resources

Sounds of the World's Animals —
www.georgetown.edu/faculty/ballc/animals/

What is Grain Sorghum? — Kansas Grain Sorghum Producers Association, www.ksgrains.com/sorghum/what.html

BEEKEEPING

All About our Work Photo Gallery — Kutik's Honey Farm — NY, kutikshoney.com/gallery.htm

Bee Cam / Beekeeping Photo Album, Draper's Super Bee Apiaries, PA, www.draperbee.com/index.htm

Beekeeping Pictures — Mason Farm Honey — NJ, www.robinhill.com/pictures.htm

Honey, Honey Resource Kit — Kondinin Group — Australia, www.kondinin.com.au/WorkbootSeries/default.asp, (Workboot Series — order through Bookshop on web site)

Honey Bees Information and Activity Sheets — University of Arizona, ag.arizona.edu/pubs/insects/ahb/ahbhome.html

Honey Production — Sioux Honey Association, www.suebee.com/production.html

Just for Kids — National Honey Board, www.honey.com/kids/index.html

Miller's Honey — CA, www.millershoney.com/, (migratory beekeeping)

The Story of Honey, The Story of Pollination — National Honey Board, www.nhb.org/pollination.html

Teacher's Resources — National Honey Board, www.honey.com/kids/teach.html, www.honey.com/education/index.htm

Videos — Honey Processing Plant — Billy Bee Honey, www.billybee.com/frames-story.html

CATTLE — BEEF AND DAIRY

Angus History — American Angus Association, www.angus.org/ang_hist.htm

Cowsnus — Beef and Dairy Youth, CO, www.cowsnus.com

Dairy Cam (Includes Milking Parlor) www.dairycam.com

A Day on the Dairy Farm, Fun Facts — Dairy Farmers of America, www.dfamilk.com/farmfamily/index.html#

Extra Cheese, Please!: A Teaching Guide, Boyd Mills Press, www.boydmillspress.com, (Listed Under Teaching Ideas)

Frequently Asked Questions — National Milk Producers Federation, www.nmpf.org

Kansas Feedyard Map — Kansas Livestock Association, www.kla.org/mainmap.htm

Video Clips — Dairy, Dairy Plant and Bakery, Farming Operations, Braum's Dairy, www.braums.com/TourBraums.asp

Virtual Feedlot Tour — Cactus Feeders, Inc., www.cactusfeeders.com/virtual_tour/index.html

GOATS

Did You Know? — American Dairy Goat Association, www.adga.org/facts.htm

Online Shows (Photos) — www.showmeatgoats.com

HORSES

Diamond R Ranch (interactive children's web site) — National Cowboy and Western Heritage Museum, www.nationalcowboymuseum.org

International Museum of the Horse, www.imh.org

Photo Gallery — Texas Tech Ranch Horse Center, www.asft.ttu.edu/horse/

Racing Hall of Fame Online — Horses, Jockeys, and Trainers, National Museum of Racing and Hall of Fame, hall.racingmuseum.org/default.asp

Ranch Web Sites — North American Equine Ranching Information Council, www.naeric.org/buyers_web.asp

POULTRY — CHICKENS, DUCKS AND TURKEYS

All about EGGS from A to Z — Georgia Egg Commission, www.georgiaeggs.org/pages/eggcylo.html

Children's Activities — Golden Eggs Farms, Australia, www.goldeneggs.com.au/childrens_activities/index.html

Poultry Virtual Tours — PennAg Industries Association, PA, www.pennag.com/virtual_tours.htm#egg, Bell and Evans — Poultry Processing Plant, Broiler Farm, Sauder's Eggs — High Tech Egg Packing Facility

Turkey History and Facts — National Turkey Federation, www.eatturkey.com/consumer/history.html

SHEEP

American Sheep Industry Association, www.sheepusa.org/, Consumers>For Kids>Lamb, Sheep, or Wool, Consumers>Sheep Industry>Fast Facts

SWINE

Facts and Figures — National Pork Producers Council, www.nppc.org/resources/facts.html

Kansas Facts — Kansas Pork Association, www.kspork.org/kansas_facts.htm

Pork 4 Kids — National Pork Board, www.pork4kids.com

Swine Production Virtual Tour — PennAg Industries Association, PA, www.pennag.com/virtual_tours.htm#egg

Animal Growth and Development

LEVEL: Lower Elementary
SUBJECTS: Math, Science
SKILLS: Comparing, sorting by characteristics

BACKGROUND INFORMATION

In the Class Introduction for Unit 2, Growth and Development, the poem tells about a new baby calf struggling to stand for the first time. His instincts help him discover how to walk and drink milk from his mother. Eventually, the calf grows up. The very definition of “living” or “alive” is to be a changing, evolving entity. Because humans are complex creatures with long life spans, it takes many years for a child to grow to adulthood. Animals are different, reaching maturity much sooner. And, most animals have a shorter life span.

Practicing good animal husbandry is an extremely important part of being a farmer or rancher. Animals that grow the fastest are kept healthy and well-fed and live in clean pens or pastures. Domesticated livestock that are neglected cannot thrive. Producers take a great deal of pride in their animals, and not solely because of greater profitability. They have the responsibility of providing good habitats for their livestock and take their jobs very seriously.

To be a good caretaker, farmers and ranchers must monitor the changes as their animals grow, often using weights and measurements. Producers keep good records so they know

the due dates of offspring and when is the ideal time to take them to market.

KANSAS SYMBOLS

The state of Kansas has designated several species as special symbols of the state. Both wild and domesticated animals can be classified into one of several groups:

Mammals are warm-blooded and provide milk for their babies. They have hair or fur and their skeletons are inside their bodies. Some domesticated mammals are swine, cattle, sheep, goats and horses. The state animal of Kansas is the American Bison, also called bison or buffalo. Some estimate that there were more than 70 million bison roaming freely throughout North America in the 1800s. Today, bison are kept in pastures and are considered domesticated.

Birds are warm-blooded and lay eggs. Birds have feathers, and most of them can fly. The Western Meadowlark is the state bird. Domesticated birds include chickens, ducks, turkeys and geese.

Amphibians and reptiles are considered cold-blooded, meaning their internal temperature is controlled by the outside environment, so they

BRIEF DESCRIPTION

The students will use cards with animal weights to line up from lightest to heaviest.

OUTCOMES

The students will

- Recognize weights of young and mature animals.

ESTIMATED TEACHING TIME

20 minutes

prefer warm weather. Reptiles lay eggs and are covered in scales or horny plates. The state reptile is the Ornate Box Turtle. Snakes are also reptiles which can be found on Kansas farms and ranches. Farmers recognize the importance of snakes in the web of life — they can help lower the population of rats and mice where grain is stored. Amphibians are similar to reptiles but have smooth skin. The state amphibian is the Barred Tiger Salamander. Other amphibians are frogs and toads.

Insects are small and have six legs. An insect's body has three main parts and is covered in an exoskeleton, rather than having bones on the inside. The honeybee has been designated as the state insect. Although not truly tame, there are beekeepers within the state who raise bees for honey production and for pollination of crops. Spiders are not insects, but arachnids because they have four pairs of legs.

INHERITED CHARACTERISTICS

The members of each group share similar characteristics. Most animals pass these characteristics to their offspring. Some are detectable while others cannot be seen. One interesting trait which is usually inherited is hide color or color pattern. A black colt has a good chance of having a white blaze down the center of his face if the stallion had one like it. These color patterns are often symmetrical. An object has symmetry if it looks the same on one side as the other side. For example, a butterfly is symmetrical because its wings are mirror images of one another.

TEACHER PREPARATION

MATERIALS NEEDED

- Copies of worksheets 2-1a and 2-1b, pages 41-42.

PREPARE AHEAD

- Cut worksheets into cards.

ACTIVITY

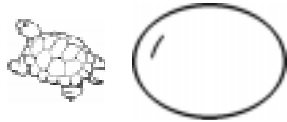
1. Select two groups of students - one for baby animal weights and one for mature animal weights.
2. Hand out the cards with animal weights and names.
3. Ask each group of students to form a line in order - from smallest to largest.
4. Compare lines. Are the animals in the same order?
5. Ask students to mix and form a single line in order of weights — smallest animal to largest animal. Discuss results.

DISCUSSION QUESTIONS

1. Why is it important to know what an animal weighs if you are a farmer? (Weight is one of the main factors in determining if an animal is ready for market. Most livestock are sold by the pound.)
2. What is the difference between a wild and a domesticated animal? (Wild animals roam freely. Domestic animals depend on their owners for food, water, space and shelter.)
3. What are some examples of wild and domesticated animals? (Wild: some birds, foxes, wolves, coyotes, mice, etc. Domesticated: cats, dogs, cattle, sheep, swine, horses, etc.)

Baby Animal Cards

Ornate Box Turtle Egg
1/4 ounce



Prairie Dog Pup
1/2 ounce

Chicken Egg
2 ounces

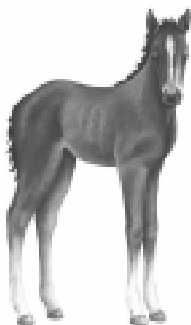
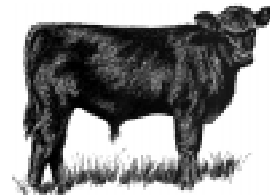


Piglet
4 pounds



Lamb
10 pounds

Calf
75 pounds



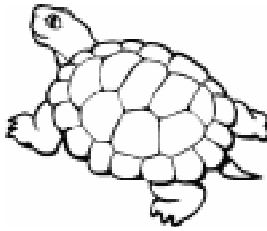
Foal
90 pounds

Bison Calf
65 pounds



Mature Animal Cards

Ornate Box Turtle
3 pounds

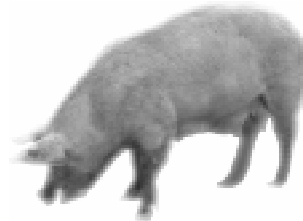


Prairie Dog
3 pounds

Hen
6 pounds



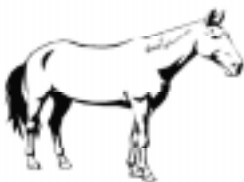
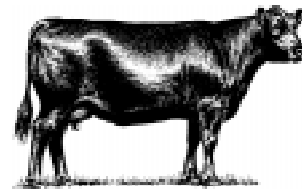
Sow
450 pounds



Ewe
140 pounds

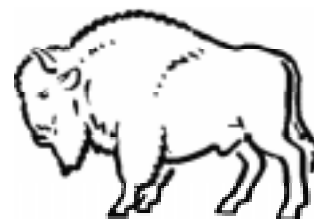


Beef Cow
1100 pounds



Mare
1200 pounds

Bison Bull
1100 pounds



Beekeeping

LEVEL: Lower Elementary

SUBJECTS: Social Studies, Science

SKILLS: Matching, responding to olfactory stimuli

BACKGROUND INFORMATION

The only insects that produce a food eaten by humans are honeybees. Honeybees are not native to the Western Hemisphere. The first honeybees in North America were brought to the colonies in the 1600s. Some honeybees escaped and lived in the wild, gradually moving westward to the edge of the Great Plains. There, a lack of hollow trees for nesting halted the movement of the honeybees until homesteaders and pioneers carried honeybees further west.

Early methods of collecting honey often resulted in the honeybees being killed. In the 1850s, Lorenzo L. Langstroth, an American minister who was interested in bees, developed a beehive that is still used by the majority of American beekeepers today. The beehive that Mr. Langstroth designed leaves a gap of approximately 5/16 inch around all sides of each frame holding a honeycomb — just enough space for a single bee to pass through. If the space is any larger or any smaller, the bees tend to fill up the space with honeycombs or a sticky glue-like substance. Either way, the frames become cemented in place and it becomes very difficult to harvest the honey. With the 5/16 inch gap, the frames slide out of the beehive and the honey can be removed.

Each beehive is populated by one colony of bees. A colony consists of 1 queen, 500 - 1,000 drones, and 30,000 - 60,000 workers. Worker bees are the honeybees that collect the nectar from plants and carry it back to the beehive where it is turned into sweet, liquid honey. Some worker bees develop into guard bees or nurse bees. Guard bees guard the hive and attack enemies, including bees belonging to other hives. Nurse bees tend to the larvae in the nursery.

The worker bees from a single beehive only collect nectar from one type of flower. Each bee may visit more than 1,000 flowers in order to collect enough nectar to fill its honey sac just one time. The honey sac is about the size of a pinhead. Worker bees may fly up to six miles in search of the right flowers. They rely on their vision to locate the correct flowers. Honeybees do not see the color red, only colors ranging from ultraviolet to orange. The petals of some flowers have ultraviolet patches similar to the runway lights at an airport which guide the bees to those flowers, even though humans can't see those patches without special equipment. In addition to ultraviolet flowers, honeybees search for blue, purple or yellow flowers.

BRIEF DESCRIPTION

The students will use scent to locate their "beehive."

OUTCOMES

The students will

- Discover that bees use scent to locate and protect their beehives.

ESTIMATED TEACHING TIME

Set up: 5 minutes
20 minutes

The size, shape, scent, color and amount of nectar determine the flowers that are chosen by honeybees.

Honeybees are important to American agriculture because they seek out flowers with pollen and transfer that pollen from flower to flower as they collect the nectar from the flowers. Pollination, the transfer of pollen, is necessary for the plant or tree to produce seeds or fruit. For example, lopsided apples are a result of inadequately pollinated blossoms. Cucumbers that are curled and slim, rather than straight and plump, are also a result of poor pollination.

The U.S. Department of Agriculture (USDA) estimates that about one-third of the food eaten by people in the United States comes from insect-pollinated plants and trees. The USDA also estimates that honeybees are responsible for 80 percent of that pollination.

In the late 1800s, commercial beekeepers began moving honeybees around to produce more honey. Today, many commercial beekeepers place beehives for pollination. The income from providing honeybees for pollinating crops may be equal to the income from honey production. Beekeepers manage the beehives, moving them around as needed and to locations providing good sources of nectar and water. Beekeepers also monitor the beehives, checking to be sure the queen is healthy and that the colony is clean and free from disease.

Beekeepers also harvest the honey from the hives. Honeybees make more honey than the colony needs and the excess honey can be extracted from the honeycombs. Approximately one-half of the honey harvested and sold in the United States is used in manufactured products — food products such as cereals and other products such as soap or shampoo.

ALFALFA

Alfalfa is one of the major sources of honey for commercial production. The alfalfa varieties grown in Kansas produce purple flowers. The honey produced by bees feeding on alfalfa blossoms is light-colored with a mild flavor.

Alfalfa is the fourth most widely grown crop in the United States — behind corn, wheat and soybeans. Alfalfa is an important source of protein and energy for the livestock industry.

Alfalfa is not native to North America. In the mid 1850s, it was proven that alfalfa could be successfully grown in the United States. The first alfalfa grown in Kansas originated in Chile, while other varieties can be traced to northern France, southern Russia, Iran, Afghanistan and Turkey.

Alfalfa is a perennial crop — it does not have to be replanted each year. In fact, many fields of alfalfa will produce for five to six years. Alfalfa plants are also good for the soil, having the ability to take

nitrogen from the air and store any extra nitrogen in the plants' roots. The stored nitrogen feeds the alfalfa plants or, when the alfalfa field is planted to another crop after a few years, the nitrogen will be there to fertilize the new crop.

Throughout the growing season, alfalfa plants will be swathed and baled into hay or chopped into feed. To produce the highest quality feed, alfalfa plants will be swathed just as they begin to bloom. The plants are cut off about two inches above the ground and begin to produce new growth. Under the best growing conditions, with timely and adequate rains, alfalfa can be cut every 28 days. In Kansas, most alfalfa fields will produce three to five cuttings of alfalfa between the last frost of spring and the first frost of winter.

Kansas has around 950,000 acres planted to alfalfa, producing more than 3.5 million tons of alfalfa each year valued at almost \$343 million. Finney County is the leading producer of alfalfa in Kansas, producing alfalfa hay worth approximately \$37.5 million each year. Barton County is second, producing more than \$15 million worth of alfalfa hay annually.

TEACHER PREPARATION

MATERIALS NEEDED

- Cotton balls
- Scented oils — peppermint, vanilla, cloves, lemon, etc.
- Small cups or containers (ketchup cups or small drinking cups)
- Resealable plastic bags

PREPARE AHEAD

1. Use scented oils or extracts that have very distinctive smells.
2. Add one to two drops of oil to each cotton ball, storing cotton balls with the same scent in a plastic bag.

ACTIVITY

1. Explain that the honeybees from each beehive collect nectar from only one type of flower and that guard bees use the sense of smell to prevent unrelated bees from entering the wrong beehive.
2. Place cups with cotton balls with the different scents at desks or points around the room. Optional: Choose one student for each location to act as a guard bee.
3. Place scented cotton balls in small cups and distribute the cups to students. Use only one scent per student but try to keep the distribution random.
4. Ask students to locate their own beehives, using the sense of smell. (If guard bees are guarding the hives, ask students to compare their scents to that of the guard bees. Guard bees will have the final say as to whether the scents are the same or different.)

DISCUSSION QUESTIONS

1. How do honeybees use the sense of smell? (To find the correct beehive and to prevent enemies or unrelated bees from entering a beehive.)
2. How do honeybees use the sense of sight? (To find the correct flowers in order to collect nectar.)
3. Why do the honeybees from one beehive only collect nectar from one type of flower? (As they collect nectar, they are also moving pollen from one flower to another. The flowers need pollen from other flowers of the same kind in order to produce seeds or fruit.)
4. Honeybees are attracted to flowers with certain colors — ultraviolet, blue, purple and yellow. How are flowers of other colors pollinated? (Other insects, butterflies, moths, some birds and bats are also pollinators, since they are attracted to specific colors or types of flowers. Some flowering plants, such as grasses and wheat, corn and soybeans are pollinated by the wind.)
5. Why are honeybees important? (They produce honey for humans; pollinate plants and trees that produce food for humans, such as apples and watermelons; and pollinate crops that feed livestock — alfalfa.)

Pasture Game

LEVEL: Lower Elementary

SUBJECTS: Science, Economics, Math

SKILLS: Developing hypothesis, counting, discussing and deciding as a class, charting predictions and results

BACKGROUND INFORMATION

Kansas is home to many types of animals. There are vast numbers of wild and domestic animals within our state borders. Domestication is a gradual process that starts with wild animals and plants. People refine these wild animals and plants into domestic forms according to their use through many generations.

Exactly how, in what order and when wild animals began to be domesticated is uncertain. It is generally believed that wolves were the first animals to be domesticated around 10,000 B.C. in southwest Asia. It is believed that sheep, goats and pigs followed about 8,000 B.C. in that same region of the world. About 4,000 B.C. donkeys (Egypt), horses (Ukraine) and water buffalo (Southwest Asia or China) began to be domesticated, with other animals following. Cattle were domesticated around 3,000 B.C. although the ancestor of cattle is extinct.

Animal domestication changed human life tremendously. Humans went from being nomadic hunters and gatherers to settling in one area in order to tend to animals and crops. This action increased the nutrition available to humans and also encouraged the concepts of land ownership and wealth within social and cultural development.

HABITATS

Today wild and domestic mammals, birds, reptiles, amphibians and insects thrive in the many diverse habitats in Kansas. A habitat is the area in which an animal or plant lives. Habitats have four elements: food, water, shelter and space. There are many different habitats for Kansas livestock and wild animals. Some include prairies, barnyards, streams, ponds, woodlands, crop fields and even cities.

The habitat of wild animals is controlled by nature. Therefore wild animals depend on their instincts for their food, water, space and shelter needs.

Domestic animals such as cattle, swine, sheep, goats and poultry depend on their owners for food, water, space and shelter. These domesticated animals are generally referred to as livestock.

Farmers and ranchers care for their domestic animals in a wide variety of ways. This care is sometimes referred to as animal husbandry. Animal husbandry not only includes feeding and watering animals but also gathering eggs, shearing sheep, building shelters, sorting pigs, fixing fences and milking cows.

BRIEF DESCRIPTION

The class will simulate the decisions that farmers and ranchers make about the number of animals in their pastures and chart the class's decisions.

OUTCOMES

The students will

- Estimate the food needs of animals.
- Recognize that food is scarce.
- Understand animal management with respect to reproduction and marketing.

ESTIMATED TEACHING TIME

60 minutes

GROUPS

People refer to groups of animals by different names. Groups of cattle, swine, horses and bison (buffalo) are called herds. Groups of sheep and birds, including poultry, are referred to as flocks. A beehive is occupied by a group of honeybees called a colony.

Many factors influence the size and location of groups of animals. There are three influences that are of extreme importance: (1) competition for available food and water, (2) the size of the food supply, and (3) availability of new feeding areas. The amount of food and water available is probably the most crucial factor in determining an area's carrying capacity. The carrying capacity is the greatest number of organisms that can be supported (carried) by an area without damaging that area.

Usually a herd of deer or other groups of wild animals will forage for food in the same area year after year. This well established territory is known as their home range. Usually only extreme conditions, such as lack of food, loss of habitat, or severe weather, will force them out of their home range. When their home range no longer contains enough food, water, space or shelter, the animals may disperse in search of new feeding areas.

Domestic animals depend on their owners for their food, water, space and shelter. It is important that farmers and ranchers meet the needs of their animals because healthy, well-cared for animals cost less to produce than do unhealthy animals.

There are many factors that contribute to the decisions farmers and ranchers make every day. What to feed their animals, how much water their animals require, as well as the amount of space and shelter each animal needs are all questions that they ask themselves. These factors contribute to determining how many animals can be carried by a pasture or pen or barnyard.

TEACHER PREPARATION**MATERIALS NEEDED**

- 10 red food chips (poker chips, checkers or squares of construction paper) per student
- 6-8 black food chips (poker chips, checkers or squares of paper) per student
- 4 plastic sandwich bags per student
- Flagging or cording, to mark off pasture
- 1 kitchen timer or watch with a second hand
- 1 copy of worksheet 2-3a, page 50.

PREPARE AHEAD

- Use the flagging or cord to mark off a circle approximately 30 feet in diameter or a square 25 feet by 25 feet to represent the pasture. Scatter the food chips throughout the circle, to represent the amount of food available in that pasture.

ACTIVITY**RULES**

1. Students should not share their food chips.
2. Once each student collects 10 food chips they must stop collecting for that round and sit down at the edge of the pasture.

INTRODUCTION

1. The students will be playing a game involving a herd of cattle. Each cow will be represented by a plastic sandwich bag. Discuss the decisions that farmers and ranchers make when determining the number of animals for their pastures (i.e., rainfall, size of pasture, available drinking water). Point out that the pasture is marked out by the flagging and the food chips represent the amount of food available in the pasture.
2. Each cow needs at least 5 but no more than 10 food chips per year. Cattle do not share their food.

THE FIRST YEAR

1. Give each student one sandwich bag.
2. Set the timer for one minute and allow students to collect food chips. (If one minute is not adequate or too long, you may adjust the time available for collecting chips).

3. At the end of the period, record on the chart the number of cattle that started the round and the number that met their food chip requirement.
4. Collect the bags that have fewer than 5 red food chips. These animals would not have had enough to eat. (All the cattle should have adequate nutrition for the first year because there were 10 food chips per student distributed.)
5. Explain that well-cared for pastures will grow and regenerate the food supply each year. Collect the food chips from the students and redistribute throughout the area.

THE SECOND YEAR

1. Explain to the students that herds grow through reproduction. Tell them they will simulate the effect of reproduction by adding one cow for every cow that survived the first year. Hand out one additional sandwich bag to each student. Each student should now be collecting food chips for two cows (bags).
2. Predict the number of cattle who will meet their nutritional needs during the second year. Record the students' prediction on the chart.
3. Set the timer. On signal, each student should try to collect between 5 and 10 red food chips for each cow (bag) they have. When they have collected 10 red food chips per bag they should sit down.
4. Record the number of cattle who met their food needs on the chart. Compare the number of thriving cattle with the group's prediction.
5. Discuss the options that farmers and ranchers have for the cattle who don't meet their food needs. Farmers and ranchers can provide supplemental feed or new pasture. A second option would be to sell them from the herd.
6. Vote on the two options. If the class votes to sell the cattle, collect the bags that have fewer than 5 red food chips and eliminate them from the game. If the class votes to provide feed, then move the students with fewer than 5 red food chips in their bag to a second designated area. Record the decision on the chart.
7. Collect the bags and redistribute the red food chips within the first pasture.

THE THIRD YEAR

1. For the cattle remaining in the first pasture, distribute one additional sandwich bag for each surviving cow. If a second pasture is used, then distribute the black food chips within the second pasture. The cattle in the second pasture will not have reproduced this year because of inadequate nutrition.
2. Continue as with year 2, making sure to make predictions and record the number of cattle.

ADDITIONAL ACTIVITY

This game could be continued to work through each of the farmer and rancher options. There are many factors that influence the nutrition available in pastures, including precipitation, fire or management. The number of food chips could be increased or decreased for additional cycles.

DISCUSSION QUESTIONS

1. What factors determine how many cattle meet nutritional requirements? (How much feed is available and how many cattle are in the pasture.)
2. What would happen if 1/4 of the food chips were removed from the pasture? Example: Because of low rainfall the pasture did not grow normally and would not sustain as many cattle. (More cattle would have to be moved or sold or additional feed would have to be provided.)
3. How would the price of new pasture influence the decision in year 2? (If the cost was too high, the cattle would be sold instead of being moved.)

Name _____

Pasture Game Recording Chart

Year	Number of Cattle at Start	Number of Cattle at End	Prediction	End of Year Options
1.				
2.				Feed _____ Sell _____
3.				

Good Feed

LEVEL: Lower Elementary
SUBJECTS: Science, Math, Art
SKILLS: Measuring and weighing, classifying by feed type, calculating

BACKGROUND INFORMATION

Both wild and domestic animals have nutritional requirements for their growth and development. Five main nutrients are needed by animals: water, energy (from carbohydrates and lipids), protein, vitamins and minerals.

Water is as important to animals as it is to us. Farmers and ranchers must provide an adequate source of water for their animals. Horses drink about ten gallons of water per day. Swine will drink anywhere from two to five gallons of water daily. Cattle can drink anywhere from 25 to 50 gallons per day. That's almost enough to fill a bathtub! Many factors contribute to the amount of water animals require such as temperature, wind speeds, whether they are pregnant or caring for young, or how active they are that day.

ANIMAL RATIONS

Farmers and ranchers feed their animals a balanced diet or ration. Animal rations provide energy, protein, vitamins and minerals. Farmers and ranchers make sure that their animal rations contain the correct ratios of concentrates, forages, and supplements. It takes about 3 1/2 pounds of feed to produce a pound of pork and about 8 1/2 pounds of feed to produce a

pound of beef. For poultry, it takes about two pounds of feed to produce a pound of meat and about four pounds of feed to produce a dozen eggs.

Concentrates are low in fiber and have nutrients that are easy to digest and use. Concentrates are often high in protein and come from crops such as corn, grain sorghum (milo) and wheat. Coproducts from these grains are also concentrates. Coproducts are products that are the result of making the primary product. Wheat bran, wheat middlings, brewer's grain and distiller's grains are coproducts from wheat and corn. These products are produced during flour milling and ethanol production. Oilseed meals, which are also concentrates, are coproducts of sunflowers and soybeans that are produced during the process of making vegetable oil.

Grains may be used in animal rations in many forms. Some grain is ground, rolled, flaked or pelleted. Pellet grain products are similar to dog food and have many ingredients that are mixed together and formed into small cylinders or pieces.

Animal species can be divided into three categories: carnivores, herbivores and omnivores. Carnivores feed on animal tissues

BRIEF DESCRIPTION

The class will prepare a trail mix that simulates animal feed.

OUTCOMES

The students will

- Determine the similarities and differences between categories of human diets and animal feed rations, package and label the product.

ESTIMATED TEACHING TIME

60 minutes

EDUCATOR'S NOTE

Recipe may need alteration for students with food allergies to peanut or wheat products.

(meat). Herbivores are plant-eating. Omnivores eat both plants and meat. Most livestock, except poultry, eat only plants. Chickens, ducks, geese and turkeys eat plants and may consume insects, worms or small fish if those are available to the birds.

More than 80 percent of the crops grown in Kansas are fed to livestock. In addition to corn, soybeans, grain sorghum and wheat, there are other crops, such as oats, sedan or millet, which are fed to livestock. Some of these crops are forages. Forages are a key element in the diets of ruminant animals. Cattle, swine and sheep, as ruminant animals, are able to turn cellulose-based plants into high-quality food for humans. They play an integral part in the food chain by turning plants that are indigestible by humans into foods that people are able to digest.

Forages, or cellulose-based plants, include both grasses and legumes. Common grasses that are grown in Kansas for animal feed include: Smooth Brome, Tall Fescue, Eastern Gamagrass, Bermuda grass, and Old World Bluestem. Common legumes that are grown in Kansas for animal feed include: alfalfa, clover, cowpeas and hairy vetch.

Typically, forages raised as a crop are called hay. Hay is cut or swathed, dried in the summer sun and baled into round or square bales. This allows the farmer and rancher some control over the amount eaten by livestock and easier shipping and sale to areas other than one single pasture. Bales are a space effective way to store and transport forages. These processes involve the use of farm equipment such as tractors, swathers, rakes, windrowers and balers.

Among the states, Kansas ranks seventh in production of alfalfa hay and all hay produced in the United States (two different categories).

Farmers and ranchers must evaluate all feed and water sources for their animals to make sure they receive the optimum amount of energy, protein, vitamins and minerals to ensure optimum growth and development. Animal rations may also include vitamin and mineral supplements. For example, a typical feed ration for cattle might include corn, soybean meal, brome hay, alfalfa and vitamin and mineral supplements.

FEED LABELS

Labels on animal feed give information that farmers and ranchers need to know to formulate the proper diet. Each feed label will list:

Type of animal: On the front of the label, a word or picture indicates the animal the feed was made for. It may also tell the stage of life or the activity level of the animal.

Ingredients: Animal feed is a mixture of products called ingredients. The main ingredient will be listed first. Feed ingredients are listed from the most to the least amount in the feed.

Nutrition: The label will have a list of the nutrients that the feed provides for the animals. This list must have three things: protein, fat and fiber.

Package Size: The label will state the amount of feed in the package. Animal feeds are almost always sold by weight.

Feeding instructions: Most labels will give instructions on how much to feed and how often to feed the animal.

TEACHER PREPARATION

MATERIALS NEEDED

- Large mixing bowl with lid or large re-sealable, plastic bag
- Re-sealable plastic bags, sandwich size, one per student (feed sack)
- 3"X4" address labels, one per student

FEED INGREDIENTS (PER STUDENT):

- 1/4 cup raisins (supplement)
- 1/4 cup dried cranberries, i.e. Craisins (supplement)
- 1/4 cup chocolate chips or M&M's (concentrate)
- 1/4 cup nuts, peanuts or other (concentrate)
- 1/2 cup Corn Chex cereal (roughage)
- 1/2 cup Shredded Wheat squares, broken (roughage)

PREPARE AHEAD

- Determine number of students participating in activity and gather ingredients based on number of students. Ingredients are listed per student.
- Note: Some students may have allergies to nuts, which are used in this activity. Educators may choose to substitute an additional 1/4 cup chocolate chips or M&M's for the nuts.
- For younger students, print address labels as feed labels for application to the re-sealable plastic bags. Use the example feed label as a guideline for layout.

ACTIVITY

1. Add each ingredient to the mixing bowl or large plastic, re-sealable bag. Mix well.
2. Divide the feed between the feed sacks. Each feed sack should have approximately 2 cups of feed mix.
3. Use worksheet 2-4a, page 54, to figure the ingredient information for the feed labels. Write this information on the address labels.
4. Weigh the individual feed bags and write the weight on the labels.
5. Apply the labels to one side of the sandwich bags.

DISCUSSION QUESTIONS

1. Animal rations provide what four things to animals? (energy, protein, vitamins, minerals)
2. What Kansas grain crops are commonly used in animal rations? (corn, grain sorghum, wheat, oats, sedan or millet)
3. Can you name three plants that are forages? (Grasses: Smooth Brome, Tall Fescue, Eastern Gamagrass, Bermuda grass, Old World Bluestem; Legumes: alfalfa, clover, cowpeas and hairy vetch)
4. Why are animals such as cattle, swine and sheep important links in the food chain? (They have special stomachs that allow them to eat and use plants like grasses to produce meat. Humans cannot digest those plants but can eat the meat, which contains necessary nutrients.)

Figuring the Feed Label

<p>FUN FEED FOR HEALTHY BODIES GUARANTEED ANALYSIS</p> <p>Supplement _____ % Concentrate _____ % Roughage _____ %</p> <p>Instructions for feeding: Feed as a snack.</p> <p>NET WEIGHT _____ LBS _____ OZS.</p>	<p>FUN FEED FOR HEALTHY BODIES GUARANTEED ANALYSIS</p> <p>Supplement _____ % Concentrate _____ % Roughage _____ %</p> <p>Instructions for feeding: Feed as a snack.</p> <p>NET WEIGHT _____ LBS _____ OZS.</p>
<p>FUN FEED FOR HEALTHY BODIES GUARANTEED ANALYSIS</p> <p>Supplement _____ % Concentrate _____ % Roughage _____ %</p> <p>Instructions for feeding: Feed as a snack.</p> <p>NET WEIGHT _____ LBS _____ OZS.</p>	<p>FUN FEED FOR HEALTHY BODIES GUARANTEED ANALYSIS</p> <p>Supplement _____ % Concentrate _____ % Roughage _____ %</p> <p>Instructions for feeding: Feed as a snack.</p> <p>NET WEIGHT _____ LBS _____ OZS.</p>
<p>FUN FEED FOR HEALTHY BODIES GUARANTEED ANALYSIS</p> <p>Supplement _____ % Concentrate _____ % Roughage _____ %</p> <p>Instructions for feeding: Feed as a snack.</p> <p>NET WEIGHT _____ LBS _____ OZS.</p>	<p>FUN FEED FOR HEALTHY BODIES GUARANTEED ANALYSIS</p> <p>Supplement _____ % Concentrate _____ % Roughage _____ %</p> <p>Instructions for feeding: Feed as a snack.</p> <p>NET WEIGHT _____ LBS _____ OZS.</p>

Weather

LEVEL: Lower Elementary

SUBJECTS: Science, Math, Art

SKILLS: Measuring, cutting, recording data

BACKGROUND INFORMATION

Kansas is a state of many contrasts. Southern Kansas is warmer than northern Kansas, which usually receives more snow. Eastern Kansas is generally cooler in the summer and warmer in the winter than western Kansas. Annual rainfall amounts range from an average of 40 inches per year in southeastern Kansas to 15 inches or less in far western regions of the state.

The availability of water significantly affects the plants and trees that grow in each area. In the eastern part of the state, plants and trees generally have adequate amounts of water and tend to compete for sunlight — causing them to grow taller. In the western part of the state, where water is scarce, plants tend to grow lower to the ground and have deeper roots to search out moisture.

Kansas is also a state that experiences extremes in temperatures — with recorded highs of over 120 degrees Fahrenheit and recorded lows of minus 40 degrees Fahrenheit. Kansas does experience all four seasons — spring, summer, fall and winter. The changes between seasons are usually gradual, just like the gradual transitions between night and day.

Kansas farmers and ranchers provide feed, water and shelter for Kansas livestock. As seasons come and go, temperatures rise and fall, and weather conditions change, the feed, water and shelter requirements of animals also change.

Animals need a constant supply of clean fresh water to regulate body temperatures, transport nutrients and wastes and digest food. Generally, animals need more water when they eat more dry matter — such as late season grasses, hay and low-moisture grain, just like humans need more water when they eat dry foods, such as crackers. Animals that are lactating (producing milk) also need more water. To keep from overheating in hot weather, animals also drink additional water. Pigs do not have sweat glands so water misters, buildings with controlled temperatures, or mud puddles are provided to help pigs keep cool on hot Kansas days.

Water requirements vary. Chickens drink up to 2 cups of water a day, particularly while laying eggs. A pig at market weight will drink 1 1/2 to 2 gallons of water a day. Large milk-producing cows will drink 25-50 gallons of water a day, the equivalent of a full bathtub.

BRIEF DESCRIPTION

The students will make weather gauging tools and log weather conditions over five days.

OUTCOMES

The students will

- Discover that the weather changes daily.
- Observe weather conditions.

ESTIMATED TEACHING TIME

Pinwheel: 20 minutes

Rain Gauge: 30 minutes

Data Recording: 15 minutes every day for five days

Wrap up: 15 minutes

EDUCATOR'S NOTE

Use a thermometer which is filled with alcohol, not mercury.

Water is provided by Kansas farmers and ranchers in many ways. Windmills pump underground water into storage tanks and animals drink from the “stock tanks.” Other stock tanks and watering tanks are filled with water — from wells or distribution systems like rural water districts. Rainfall is collected in ponds and animals walk down to the water’s edge to drink from the ponds. Animals also drink from pools of water filled by natural springs. When the weather turns cold and ice forms on the tanks and ponds, Kansas farmers and ranchers must break the ice daily — and sometimes more frequently — in order for the animals to be able to drink the water they need to survive.

When ponds and springs dry up, water still must be provided for the animals or the animals must be moved to another area with water. Many towns and communities in Kansas provide automated bulk water drops or water stocks where large quantities of water can be purchased and quickly poured into tanks carried by trucks or trailers. Hauling water from town is time-consuming and expensive but Kansas farmers and ranchers often do not have any other way to provide fresh water to the animals.

The unpredictable and ever-changing weather of Kansas can be exciting and interesting. It can also provide many challenges for the Kansas farmers and ranchers caring for animals.

TEACHER PREPARATION

MATERIALS NEEDED

- One copy of worksheet 2-5b, page 59
- Thermometer

MATERIALS NEEDED (RAIN GAUGE)

- A two-liter plastic soda bottle cut at the top to make two parts — one is the bottom for the rain catcher and one that works as a funnel to help measure the rain.
- A ruler or marks on a wide piece of tape that is taped to the bottom part of the bottle.

MATERIALS NEEDED (PINWHEEL)

- Straight (flat head) pin
- Pencil with attached eraser
- Scissors
- One copy of worksheet 2-5a, page 58

ACTIVITY

1. Using the instructions below, make a pinwheel and a rain gauge as a class.
2. Record weather data on weather log, worksheet 2-5b, page 59.

RAIN GAUGE

1. Place the ruler or marked tape so that the 0 is at the bottom of the bottle, where the rain will be caught and stored to measure amounts.
2. Place the top of the bottle upside down and into the remaining bottle for funneling the rain into the measuring gauge.
3. Keep track of the rainfall once a week for five weeks on weather log, worksheet 2-5b, page 59.

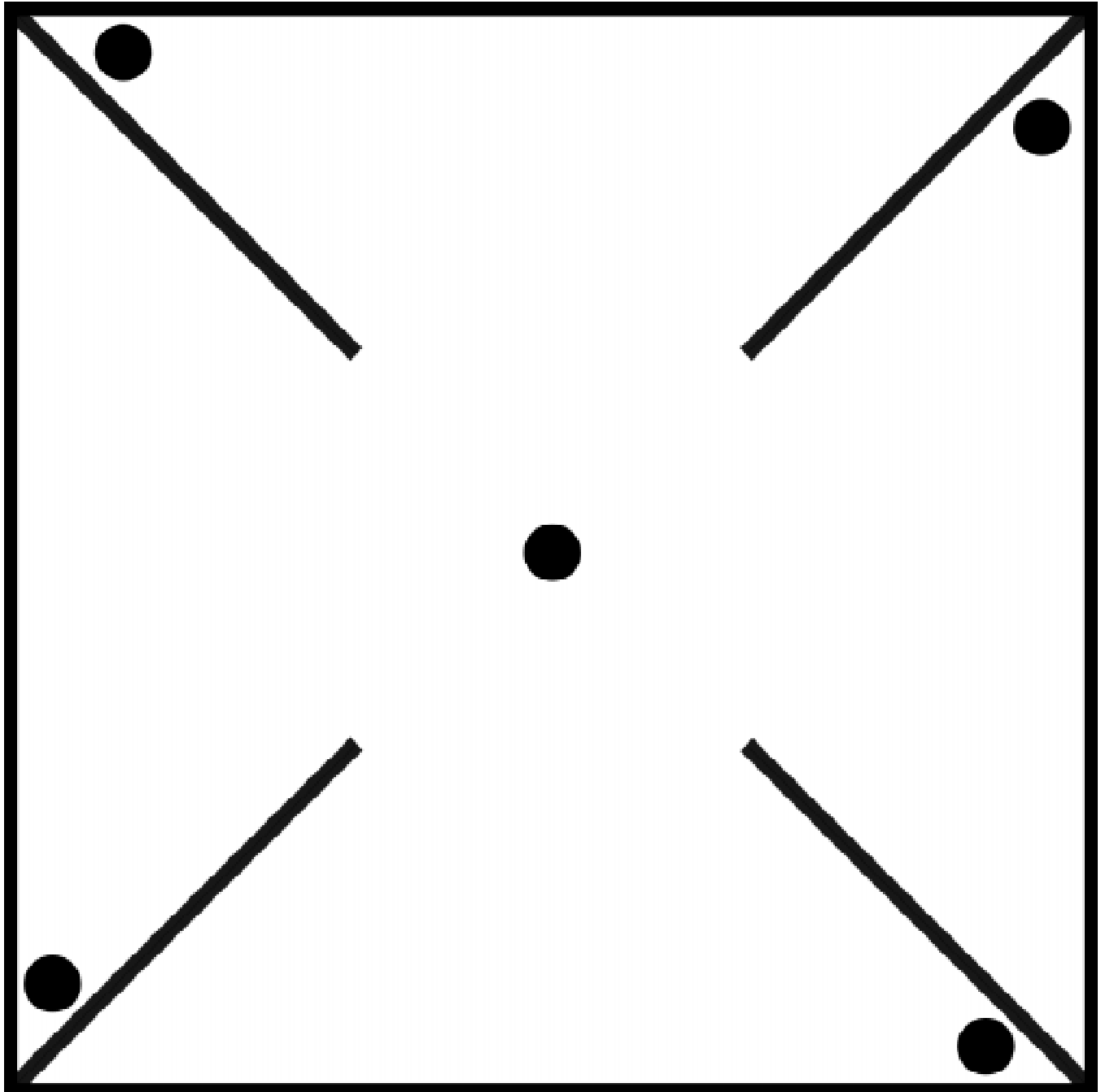
PINWHEEL

1. Decorate the square with crayons, markers or colored pencils.
2. Cut out the square and cut along all four of the lines.
3. Pull four of the outside corners into the center.
4. Pin the layers of paper into the pencil eraser, creating a pinwheel.
5. Use the pinwheel to determine wind speed once a week for five weeks. Record results on weather log, worksheet 2-5b, page 59.

DISCUSSION QUESTIONS

1. What kinds of weather did you observe and record?
2. What changes did you notice from morning to afternoon?
3. What season is it?
4. Does the season make a difference in the weather?
5. What are some of the things both people and animals do in hot weather? (Drink more water, stay in the shade, more active outdoors in the mornings and evenings when it is cooler.)
6. If it is windy, will a windmill pump more water or less water? (More water — the blades of the windmill spin faster creating more energy to pump water more quickly.)
7. Do windmills always pump water? (No. Each windmill has a brake that can stop the blades from spinning. Once the tank is full, the farmer or rancher will “turn off” the windmill by pulling a lever attached to the brake.)
8. How does water get into a pond? (When the soil is saturated and cannot hold any more water, any extra water will flow downhill and collect in low places. Ponds are often placed in those low areas.)
9. Which would add more water to a pond — rain or snow? (Rain — it takes several inches of snow to equal the water in one inch of rain. Also, as snow melts, it may soak into the soil.)
10. Does your town have a bulk water drop or bulk water stock?

Pinwheel Template



Name _____

Weather Log

Date	/ /	/ /	/ /	/ /	/ /
Time	<input type="checkbox"/> AM <input type="checkbox"/> PM	<input type="checkbox"/> AM <input type="checkbox"/> PM	<input type="checkbox"/> AM <input type="checkbox"/> PM	<input type="checkbox"/> AM <input type="checkbox"/> PM	<input type="checkbox"/> AM <input type="checkbox"/> PM
Temperature	°F	°F	°F	°F	°F
Sky	<input type="checkbox"/> Clear <input type="checkbox"/> Partly cloudy <input type="checkbox"/> Overcast	<input type="checkbox"/> Clear <input type="checkbox"/> Partly cloudy <input type="checkbox"/> Overcast	<input type="checkbox"/> Clear <input type="checkbox"/> Partly cloudy <input type="checkbox"/> Overcast	<input type="checkbox"/> Clear <input type="checkbox"/> Partly cloudy <input type="checkbox"/> Overcast	<input type="checkbox"/> Clear <input type="checkbox"/> Partly cloudy <input type="checkbox"/> Overcast
Wind Speed	<input type="checkbox"/> None <input type="checkbox"/> Slow <input type="checkbox"/> Fast	<input type="checkbox"/> None <input type="checkbox"/> Slow <input type="checkbox"/> Fast	<input type="checkbox"/> None <input type="checkbox"/> Slow <input type="checkbox"/> Fast	<input type="checkbox"/> None <input type="checkbox"/> Slow <input type="checkbox"/> Fast	<input type="checkbox"/> None <input type="checkbox"/> Slow <input type="checkbox"/> Fast
Precipitation Amount					
Precipitation Type	<input type="checkbox"/> Rain <input type="checkbox"/> Drizzle <input type="checkbox"/> Snow	<input type="checkbox"/> Rain <input type="checkbox"/> Drizzle <input type="checkbox"/> Snow	<input type="checkbox"/> Rain <input type="checkbox"/> Drizzle <input type="checkbox"/> Snow	<input type="checkbox"/> Rain <input type="checkbox"/> Drizzle <input type="checkbox"/> Snow	<input type="checkbox"/> Rain <input type="checkbox"/> Drizzle <input type="checkbox"/> Snow

Unit 2: What I Know About How Kansas Animals Grow

Directions: Fill in the blanks, using the words in the Word Bank.

1. _____ animals depend on their owners for food, water, space and shelter.
2. Honeybees use the sense of _____ to find the correct beehive.
3. Honeybees produce _____ for humans and also pollinate _____.
4. Animal _____ provide energy, protein, vitamins and minerals for animals.
5. In hot _____, both people and animals drink more water and stay in the shade.

Word Bank

Domestic

honey

plants

rations

smell

weather