



All Ears!

Level



Rabbit Project Activity Guide

Name _____ County _____



REVIEWED & RECOMMENDED
National 4-H Curriculum

Note to the Adult Helper

If you were a project helper for one or more youth involved in completing Rabbit 1 *What's Happening* or Rabbit 2 *Making Tracks* you know what a great experience this important role is. As a helper you are in the perfect position to help youth grow and develop in positive ways as they learn about rabbits and themselves. You nurture and cultivate their interest in this project by guiding their planning, helping them complete their activities and recognizing them for a job well done.

Your Role

- Become familiar with the material in this activity guide and the *Helper's Guide*
- Support youth in their efforts to set goals and complete each achievement program
- Date and initial the activities on the Rabbit Achievement Program as they are completed and discussed
- Help youth to get to know themselves, including their strengths and weaknesses
- Encourage the use of the experiential learning cycle described on this page

The Rabbit "Skills for Life" Series

This guide, *All Ears*, is the third in the series of three for youth, which also includes Rabbit 1 *What's Happening*, Rabbit 2 *Making Tracks* and the *Rabbit Helper's Guide*. The three youth guides have been designed to be developmentally appropriate for grades 3–5, 6–8 and 9–12 respectively, but may be used by youth in any grade based on their project skills and expertise.

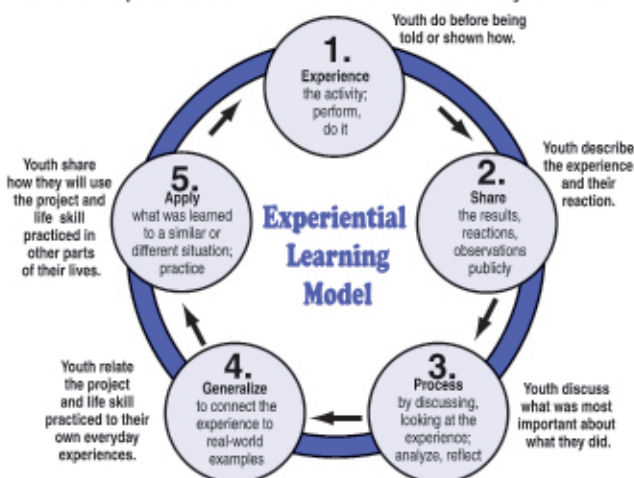
All activities in the guides have several parts: A description of the skills to be practiced, discussion questions, suggestions for additional activities and additional helpful information. The "Success Indicator" listed for each activity is an excellent way to evaluate the youth's success. Classroom teachers can measure against the science standard listed for each activity. Each of the guides also includes an achievement program to encourage youth to learn more about rabbits while developing important life skills. In the *Helper's Guide* you will find another evaluation piece titled "Evaluating the Impact." Use this before the youth begins each level and after each level is completed.

Each activity is designed so the young person has an opportunity to learn by doing before being told or shown how. Your challenge is to "sit on your hands" while the youth explores and learns, even when things don't seem to work the way you expected them to. You can help most effectively by listening as the young person considers the questions and draws conclusions. At times the activity may call for you to be a resource person for content or ideas.

The fourth publication in this series, *Rabbit Helper's Guide*, provides additional learn-by-doing activities that can be adapted for families, classrooms, after school child care, 4-H project groups, clubs or other groups. You'll also find helpful hints about characteristics of youth, life skill development, teaching experientially, club meeting ideas and answers to many of the activities in the youth guides.

Experiential Learning Model

This five-step model is included in each activity in this series.



Pfeiffer, J.W., & Jones, J.E., "Reference Guide to Handbooks and Annuals" © 1983 John Wiley & Sons, Inc. Reprinted with permission of John Wiley & Sons, Inc.

As you can see, the youth first attempt the activity without assistance. After the youth do as much as they can you then meet together and discuss: What did they do? What was important about what they did? How does what they did relate to their lives? And finally, how might they use the life and project skills practiced in the future? Sample questions are included following each experience. Your ability to ask additional thought-provoking questions and to clarify and expand participant ideas will add to the educational experience.

Good luck in your helper role and thank you for contributing to the positive development of youth.

Acknowledgements

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Level 1



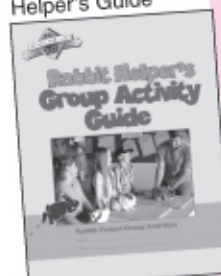
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Level 2



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Helper's Guide



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What's Behind?

Rabbit 1 What's Happening?

Chapter 1 Rabbit Selection and Handling

Hop On Board
Furry Future
Get a Grip
Parts Are Parts

Chapter 2 Rabbit Management

Caring for Rabbits
Gears, Goods and Gadgets
Hutch Sweet Hutch
Hidden Secrets

Chapter 3 Rabbit Health and Nutrition

Bug Off!
Sanitation Situation
Chef Hare

Chapter 4 Rabbit Reproduction and Marketing

Rabbit Repro
Kits 'N' Kaboodle
Baby Boom
Off to Market

Rabbit 2 Making Tracks

Chapter 1 Rabbit Selection and Showing

You Be the Judge
Take One
Top Hat and Tails

Chapter 2 Rabbit Management

Tattoo Parlor
Homeward Bound
Dollars and Sense

Chapter 3 Rabbit Health and Reproduction

Administering Medicine
Tipping the Scales
Disease Detectives

Chapter 4 Marketing Rabbits

Going Public
Hare Harvest
We'd Love To Have You To Dinner
An Animal Career...Is It For Me?

What's Ahead?

Helper's Guide

Chapter 1 Rabbit Selection and Judging

Tour Time
Checking for Disqualifications
Identifying Rabbit Breeds

Chapter 2 Rabbit Health and Welfare

Weathering the Weather
Recognizing the Normal Rabbit
Post Mortem
Lights, Camera, Action!

Chapter 3 Rabbit Word Games

Rapping on Rabbits
Playing Rabbit Categories
Rabbit Pyramid Challenge
Rabbit Bingo

Chapter 4 Rabbit Knowledge and Skills

Quiz Bowl Time
Name on the Back
Rabbit Skillathon Fun

Answer Key, Levels 1, 2 and 3
Rabbit Project Meeting Ideas
Evaluating the Impact of National
4-H Curriculum "Skills for Life"
Rabbit Series
Rabbit Resources



How This Book Works!

By now you are probably an expert on rabbits or certainly know more than you did when you started this project. Whether you have or don't have rabbits, you are in an excellent position to share your experiences with others. This guide provides several opportunities for you to develop your leadership skills as you complete Level 3 of the Rabbit Achievement Program. You'll also find activities to help you promote rabbits, explore careers and plan and organize activities.

Each chapter teaches skills about related topics. Through a short activity, you'll learn rabbit, life and science skills.

Hop to it!

Activities

Activities are a part of each lesson. You're required to do up to 21 of the activities and the More Challenges if you use this book for three years. You're required to do seven activities each year.

Rabbit Rap

Talk it Over

Questions that will help you think through what you've learned and how it applies to your life.

Rabbit Facts

Facts

Additional rabbit information to enhance the activity.

Check this out!

References

Other places to check for information that will enhance the activity.

Bounding Ahead

Bounding Ahead

These are ways to learn more about rabbit or life skills. These are optional activities that will add to your understanding.

Did you know?

Rabbit Trivia

Interesting facts that will expand your rabbit knowledge.

Your Project Helper

You may choose your own helper. This person might be a project leader or advisor, teacher, family member, neighbor, friend or anyone who is interested in working with you to complete Level 3. You'll meet with your helper as you set goals and plan and complete the activities in this guide. Discussing each activity with your helper and having this person initial your achievement program will make this project more interesting and fun. Write the name and phone number of your helper here:

My Project Helper _____

Phone # _____

E-mail _____

**Have Fun with Rabbit 3
All Ears**



All Ears Achievement Program

Rabbits _____ Breed(s) _____

Date and list the exciting things you do and learn.

- Do at least seven of the Required and Optional Achievement Program activities each year.
- Complete at least 21 of the Required and Optional activities within three years to complete this achievement program.
- Have your project helper date and initial the activities as you complete them and discuss them with your helper.

Complete at least 11 of these activities.

Activities	Date Completed	Helper's Initials
Chapter 1 Breeding and Genetics		
All in the Family		
What's Inside?		
Determining Pregnancy		
X's and Y's		
Chapter 2 Management and Disease Prevention		
Designing a Rabbitry		
The Rabbit's Digestive System		
Culling by the Numbers		
Dr. Jeckyl and Mr. Hare		
Chapter 3 History and Taxonomy		
Circle of Life		
a.k.a. Domestic Rabbit		
Chapter 4 Shows and Sportsmanship		
The Best of the Best		
Registering a Rabbit		
Chapter 5 Marketing and Project Expansion		
Researching the Law		
Rabbit Marketing 101		
Is the Pelt Prime?		
Broader Horizons		

Bounding Ahead

Select and do any of the Bounding Ahead activities in *All Ears* or make up your own. Record the page and number of each one you complete and have your helper initial.

Page	#	Date Completed	Helper's Initials

Write your own activity here.

Date _____ Helper's Initials _____

Chapter

1

Breeding and Genetics

All in the Family

Stop and think: a key to successful rabbit production is identifying and using a sound breeding program. Whether you have commercial or show rabbits, you will want to decide which breeding program will work best. A breeding program involves choosing bucks and does for mating based on their pedigree and performance records. In this activity you will learn the differences between breeding programs, such as inbreeding and line crossing, so that you can develop your own breeding program.

Rabbit Skill:

Choosing a breeding program

Life Skill:

Decision making

Success Indicator:

Uses decision making skills to develop and adopt a sound breeding program.

Science Standard:

Biological evolution

“Hop to it!”

After studying pedigrees and interviewing reputable rabbit breeders, describe a breeding program (inbreeding, linebreeding, outcrossing or crossbreeding) that best fits your type of breeding stock.

Type of breeding program _____

Description _____

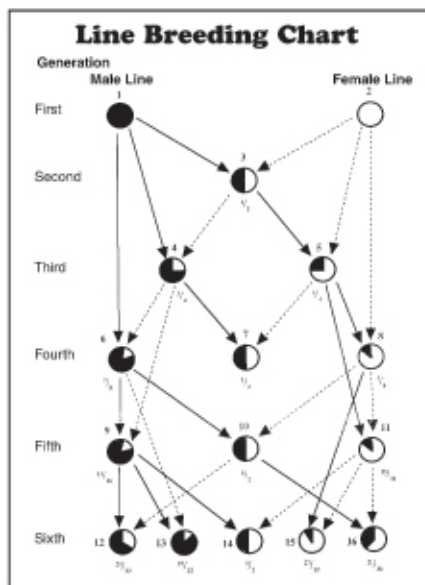
Line Breeding Example

The breeding chart illustrated may be used to carry out a linebreeding program. The circles represent the offspring, a solid line leading from a circle represents the male and a dotted line represents the female. Number 3 is a result of mating 1 and 2 and contains half of the genetic makeup of the sire and dam.

Number 4 is a result of mating No. 1 and No. 3. Number 4 now contains 75% of the genetic makeup of the male and only 25% of the genetic makeup of the female.

Mating No. 3 male to No. 2 will produce No. 5. Number 5 has 75% of the original dam's genetic makeup and only 25% of the genetic makeup of the original sire.

Mating of No. 4 male with a No. 5 female results in No. 7. Number 7 has 50% of the original sire's genetic makeup and 50% of the original dam's genetic makeup.



Using the linebreeding chart, figure out the genetic makeup of the offspring if:

Number 7 is mated to No. 11

_____ % Dam's genetic makeup

Number 9 is mated to No. 11

_____ % Sire's genetic makeup



Explore more at

www.4-hcurriculum.org

National 4-H Curriculum

Rabbit Rap

Share What You Did

- What breeding program did you choose? Why?

Process What's Important

- How do the various programs differ? Tell what is important about deciding on a breeding program.

Generalize to Your Life

- What economic impact will your rabbit breeding program have on your personal life?

Apply What You Learned

- How does comparison shopping save you money?



Breeding Programs

	Pros	Cons
Inbreeding	like gene pairs eliminates tissue rejection eliminates heredity difference	depression decreased litter size increased susceptibility to disease
Outcrossing	maximum genetic diversity vigorous offspring large litters	poor lab use
Linebreeding	similar gene pairs	decreased level of negative traits as inbreeding
Crossbreeding	produces new breed/variety hybrid vigor	unacceptable for show



Did you know

Generally, an inbred rabbit breeds better than it looks whereas an outcrossed rabbit looks better than it breeds.

Bounding Ahead

- Visit a reputable rabbit breeder to discuss breeding programs. Carefully study several rabbit pedigrees. Report your findings to your helper.

What's Inside?

If you are a good judge of rabbits you probably have a very good idea what the skeleton of a rabbit looks like. When you examine a rabbit do you know when you touch the ribs, sternum and spine? How about the femur, tibia and ulna? In this activity you'll have an opportunity to learn the names and location of 20 bones in the rabbit's skeleton.

Rabbit Skill:

Life Skill:

Success Indicator:

Science Standard:

Identify bones of a rabbit's skeleton.

Learning to learn—locating resources

Identifies 20 parts of a rabbit's skeleton.

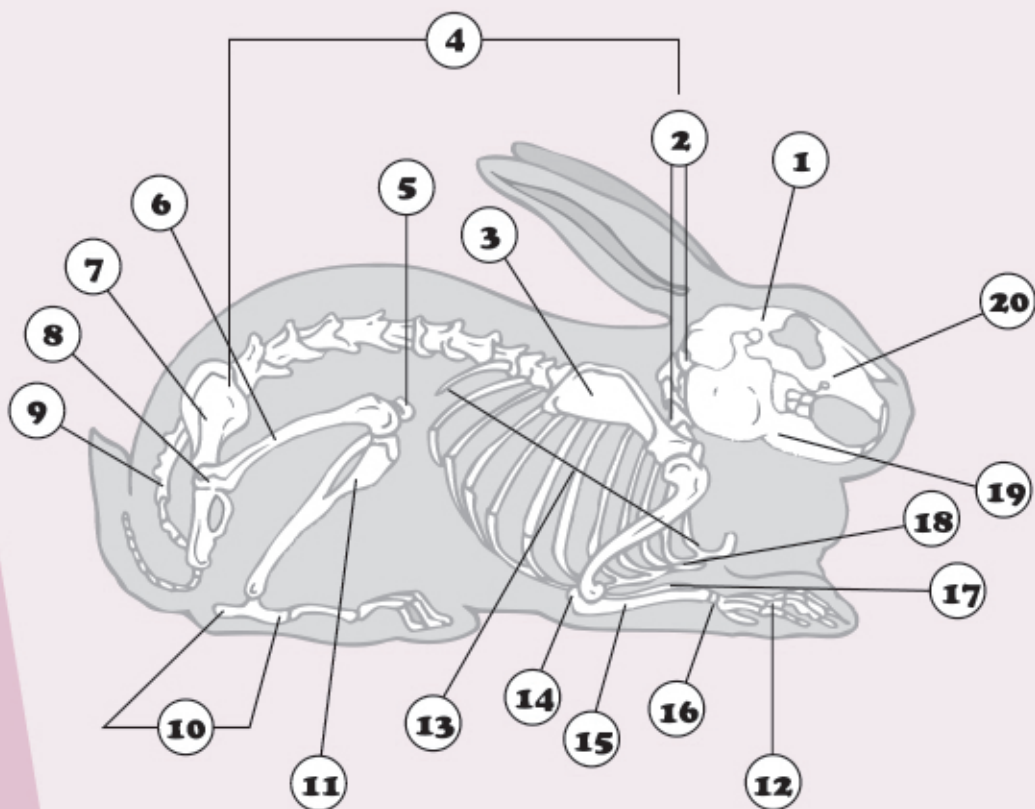
Form and function

Hop to it!

Match the number of each bone to its name. Then when you meet with your helper explain the importance of each bone in relation to both judging and rabbit meat cuts.

Bone Bank

- _____ caudal vertebrae
- _____ cervical vertebrae
- _____ elbow
- _____ femur
- _____ hip joint
- _____ mandible
- _____ maxilla
- _____ metatarsus
- _____ patella
- _____ pelvis
- _____ phalanges
- _____ radius
- _____ ribs
- _____ scapula
- _____ skull
- _____ spine
- _____ sternum
- _____ tarsus
- _____ tibia
- _____ ulna



Did you know

You can check the bone size of a rabbit by feeling the front leg.

Rabbit Rap

Share What You Did

- What new bones did you discover? How did you learn the names and locations?

Process What's Important

- What bones relate to what parts of a rabbit that are consumed?

Generalize to Your Life

- Why is knowing where to find answers sometimes more important than knowing the answers?

Apply What You Learned

- How can knowing the skeletal structure of a rabbit help you select better rabbits? What learning strategies do you prefer? Why?



Rabbits raised as pets can be spayed or neutered, as dogs and cats are, to prevent unwanted offspring.



Explore more at

www.4-hcurriculum.org

National 4-H Curriculum

Acknowledgments: Adapted from The New Rabbit Handbook



Skeleton Mounting Hints

Materials. Glue, knife, paint brush, 2' #30 aluminum wire, 3' #22 wire, 16" stainless steel wire 1/16" diameter, 21" piece 3/16 diameter stainless steel rod, toothbrush, chlorine bleach, 7" x 12" x 1" hardwood for base, small drill.

- **Step 1.** After euthenizing the rabbit remove the skin and all viscera (internal organs). Then carefully cut the meat off so as not to harm any of the bones.
- **Step 2.** Fold the skeleton and tie with a string to make a small compact mass of intact skeleton.
- **Step 3.** Boil the carcass for two hours and simmer for an additional four hours. Then cool, remove any remaining flesh and scrub the bones clean with a tooth brush. String the bones in the neck and tail with wire to keep them in order.
- **Step 4.** Dry at room temperature or bake at 200 degree F for an hour. Then bleach for 24 hours in solution of one cup of chlorine bleach in four quarts of water.
- **Step 5.** Bend the rod to support the bones. Push heavy wire inside the neural canal of the fused vertebrae of the back. Put the first thoracic vertebrae in place and then put the cervical (neck) vertebrae on the wire in their normal positions and glue together.
- **Step 6.** Drill small holes and wire the femurs of the legs into the sockets of the pelvic girdle. Wire or glue the bones of the legs together.
- **Step 7.** Based on the length of the legs cut the rod so the skeleton is supported in an upright position and anchor the rod to the base board. Glue the digits against the wood base.
- **Step 8.** Glue and wire the lower mandible to the skull. A cemented thread can be used to hold the hypoid apparatus and the ocular rings.
- **Step 9.** Retouch the many joints with quick-drying cement then spray the skeleton with clear plastic for preservation or brush it with a thin coat of varnish.



Bounding Ahead

1. Use the bones of a rabbit to construct your very own rabbit skeleton. See Rabbit Facts for tips on how to do this.

Determining Pregnancy

Is she or isn't she? Only about 70% of does conceive on the first mating. If you are able to palpate a doe to see if she is pregnant you will be able to rebreed her much sooner than if you wait a full month to see if she kindles. In this activity you'll practice your palpation technique and demonstrate it to others.



Rabbit Skill: Determining pregnancy
Life Skill: Making decisions
Success Indicator: Demonstrates how to palpate a doe.
Science Standard: Biological evolution

“Hop to it!”

Practice your palpation technique on several rabbits and then demonstrate how to do this skill to a group. Check Rabbit Facts for hints. Often working with someone who is experienced will help you acquire the “feel” necessary. Palpation can be frustrating if you don't understand the anatomy of the female reproductive system. A drawing is shown. You may also want to use the model rabbit made from the National 4-H Curriculum Rabbit Pattern to practice and use for your presentation. See if you can feel the embryos (marbles).



Model Rabbit Pattern

The model rabbit made from this pattern provides an excellent training aid for use by 4-H project leaders, extension educators, vocational instructors and classroom teachers. You'll also enjoy using the model to give demonstrations at club meetings and fairs. The use of Velcroed tails and legs, plus



realistic teeth, ear canker, interchangeable sex organs and application as a puppet contribute to its versatility.

When a person who is new to the rabbit industry is first learning management skills, the model rabbit offers a practical way to more fully control the learning environment while still providing enough realism to contribute to the learning outcome desired. Often injury to both animal and individual can be avoided by first practicing on the model before using the live animal.

Some of the management practices which 4-H members have demonstrated using the model made from this pattern include the following:

- Identifying breeds
- Identifying parts
- Determining finish
- Judging conformation
- Identifying types of fur
- Recognizing breed standards
- Determining pregnancy
- Recognizing the normal rabbit
- Determining sex
- Identifying rabbit disqualifications
- Handling
- Trimming nails
- Fitting
- Showing
- Tattooing

Tape a picture here of you palpating a rabbit.



Explore more at
www.4-hcurriculum.org

National 4-H Curriculum

Rabbit Rap

Share What You Did

- How did you palpate a doe?

Process What's Important

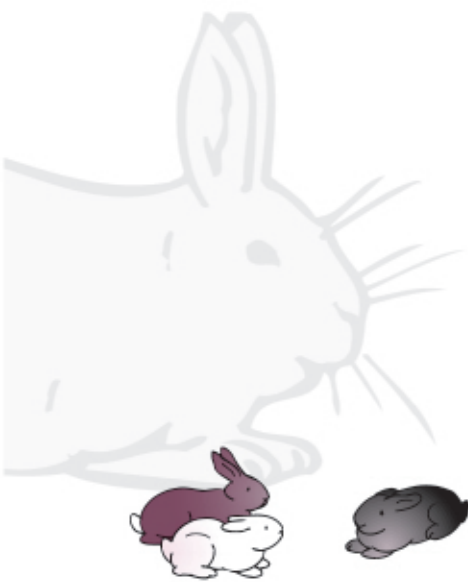
- What special care does a pregnant doe require? Why should you palpate a doe to determine pregnancy?

Generalize to Your Life

- How did preparing for a presentation help you learn the technique?

Apply What You Learned

- How does practice and showing others help you learn?



Acknowledgments: Adapted from Kansas 4-H Rabbit Curriculum Notebook.



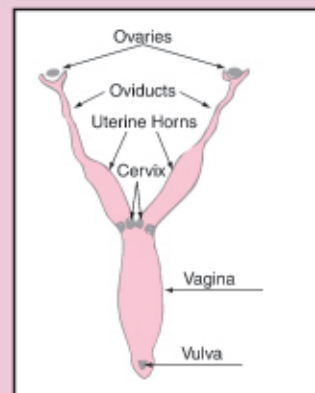
The Female Rabbit Reproductive Tract

The reproductive tract in female rabbits consists of the vagina, body of the uterus, cervix (2), horns (2) of the uterus, oviducts (2) and **ovaries** (2). The ovaries are located beside the midline and attached to the back of the abdominal cavity in masses of ovarian fat. This attachment is just behind the kidneys on each side of the body. The ovaries are about the size of a small bean.

The function of the ovary is to produce the eggs (ova) that are capable of being fertilized by the male sperm. The ovaries are connected to the horns of the **uterus** via small tubes, the **oviducts**. The function of the oviducts is to transport the eggs to the uterine horns.

The uterus is "Y"-shaped and is attached on the end of the oviducts. The length of the **uterine horns** are determined by heredity and will control the size of the litter. The uterine horns and body of the uterus are where the **sperm** and **egg** unite and where the **fetus** will develop to maturity.

The **cervix** divides the uterus from the **vagina** and provides a barrier through its secretions that prevent organisms from entering the uterus and disrupting the pregnancy. The vagina extends from the cervix to the vulva and is the receptacle used for receiving the sperm.



Palpation Techniques

- Position:** You and the doe should be relaxed and comfortable. The posterior abdominal area of the doe should rest in the palm of your hands.
- Palpation Site:** The area to be explored is behind the last rib and in front of the pelvis. Early in the gestation period (9–13 days) the fetus will lie mostly posterior and high in the abdominal cavity.
- Restraint:** When you and the doe are in position, gently lift your hand to come into contact with the posterior abdominal muscles just in front of the hind legs and pelvis. The thumb should be on one side of the abdominal cavity and the four fingers on the opposite side. The doe should be in a "stretched out" position with you raising her rear quarters until just the tips of her rear feet are touching the table. Wait for the doe to relax in this position. Use your other hand to restrain the doe by holding her head gently.
- Hand Movement:** When the abdominal muscles are relaxed, feel for internal structures between the thumb and fingers (held tight together) starting at the most posterior area of the abdominal cavity. Never use more pressure than it would take to rupture a grape. Move the hand to explore the entire abdominal cavity. Feel for a very round, firm, marble-shaped object in the early stages of pregnancy. After 15 days the fetus will start to elongate. Once a fetus is located discontinue the evaluation.

When first starting it is easiest to palpate the does at about 14 days into the gestation period. The marble-sized fetus are easiest to feel and are the most difficult to damage at this time. You may find it advisable to withhold feed for 24 hours before palpation.

Bounding Ahead

- Conduct a clinic or skillathon station on palpating a rabbit. Involve the audience rather than telling or showing.
- If you had 50 does and by palpating were able to tell that 10 were not pregnant at 15 days after each mating, over a year's time how many days of non-productivity would you save?



X's and Y's

After you have some experience breeding and raising rabbits, it's time to think about improving your rabbit herd. Learning about different breeding programs and genetics will give you helpful information for improving your herd.

For more information about breeding programs and the advantages and disadvantages of each system, see *A Progressive Program for Raising Better Rabbits and Cavies* published by the A.R.B.A., or talk to an established breeder.

Rabbit Skill:

Life Skill:

Success Indicator:

Science Standard:

Learning the importance of genetics in rabbit breeding
Learning to learn
Completes a genetic problem.
Molecular basis of heredity

Hop to it!

With your helper, work through the following genetic problem. Answers are included in the Answer Key in the Helper's Guide.

- Using the information and example in Rabbit Facts diagram what the offspring would be if a doe carrying a dominant (B) and a recessive gene (b) for bucktooth is mated with a buck containing two recessive genes for bucktooth (bb).

	Doe	
	_____	_____
	<div></div>	<div></div>
	<div></div>	<div></div>
Buck	_____	_____
	<div></div>	<div></div>

Offspring normal? _____

Offspring bucktoothed _____

- In rabbits the gene for spotted pattern (S) is dominant over the gene for self-colored (s). The gene for short hair (F) is dominant over the gene for long hair (f) (Angora).

Show what the possibilities are for the offspring if a pure breeding, spotted, patterned short-hair rabbit is mated to a self-colored Angora rabbit.

	ssff	ssff
	<div>SSFF</div>	<div></div>
	<div>SSFF</div>	<div></div>

Genotype _____

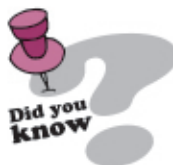
Phenotype _____

- Coat color in rabbits involves the interaction of many genes. All recognized breeds and varieties of rabbits can be classified into one of the following: Agouti (A), Tan (at), Self (a) according to their genotype. What is the phenotype of the rabbits when the genotype is:

Aa _____ ata _____

aa _____ atat _____

Aat _____ AA _____



The act of mating stimulates the doe to ovulate or shed her eggs so fertilization with the sperm from the buck can occur. A rabbit is an induced ovulator.



Explore more at
www.4-hcurriculum.org

National 4-H Curriculum

Rabbit Rap

Share What You Did

- What did you learn by doing the genetic problems?
- Where did you find additional resources about genetics?

Process What's Important

- Why is it important to know the genotype that produces each phenotype?

Generalize to Your Life

- What are the advantages of working with a knowledgeable person?

Apply What You Learned

- How can you be a mentor to younger youth?

Rabbit Facts

Rabbit Genetics

Each rabbit develops from a single cell, the fertilized egg. This single cell divides to form two cells, then these divide to four, then eight and so on. In the first divisions, mother and daughter cells are identical; later daughter cells are produced which change to form tissues and organs which make up the rabbit's body. The genetic materials of these cells is composed of many small units referred to as genes. **Genes** are located on thread-like bodies called **chromosomes**.

Chromosomes occur in pairs and their numbers vary from one species of animal to another. Genes also occur in pairs. Genes are passed from parent to offspring in sex cells known as gametes. Female gametes are called **ova** or eggs, and male gametes are known as **spermatozoa** or sperm.

Meiosis

An important step in the formation of gametes is a random separation of the paired chromosomes to form new cells having only one chromosome of each pair. This process is called meiosis. At fertilization, the female and male gametes unite and the pair of chromosomes is restored. Thus, the number of chromosomes in the offspring remain constant from generation to generation. One pair of chromosomes (referred to as X and Y) determine the sex of the rabbit. If X and Y chromosomes are paired at fertilization, a male is produced; if two X chromosomes are paired a female is produced. The female can transmit only X chromosomes to her offspring, but a male can contribute either an X or Y chromosome.

Genotype and Phenotype

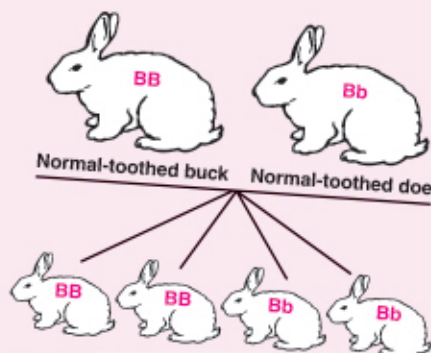
Characteristics of rabbits may be controlled by one or many genes. Traits such as coat color are controlled by one or two pairs of genes. Growth rate, litter size, and milking ability are controlled by several or possibly many pairs of genes.

Genotype refers to the make-up or combination of genes that control a particular characteristic. The response visibly observed from the genotype is called the **phenotype**; for example, color, size, etc.

Two genes control color in rabbits: a for albinism (absence of color) and A for full color (actual color depends on other genes). Since genes appear in pairs, combinations possible are AA, Aa or aa. When either AA or aa occur the genes are said to be homozygous. When Aa occurs the genes are said to be heterozygous. The dominant gene is "A" and the recessive gene is "a".

Dominant and Recessive Genes

Certain genes may hide the effect of other genes. These genes are called "**dominant**." The hidden gene is referred to as "**recessive**." Recessive genes are important in rabbit breeding. Defects such as buckteeth are due to recessive genes. (See diagram.) It is important to know how to identify those rabbits carrying recessive genes. An excellent discussion of the recessive gene problem appears in the A.R.B.A.'s *Official Guide to Raising Better Rabbits*.



Bounding Ahead

1. With your adult helper, conduct a real-life rabbit breeding experiment. Analyze and report the results in a science fair exhibit or demonstration.