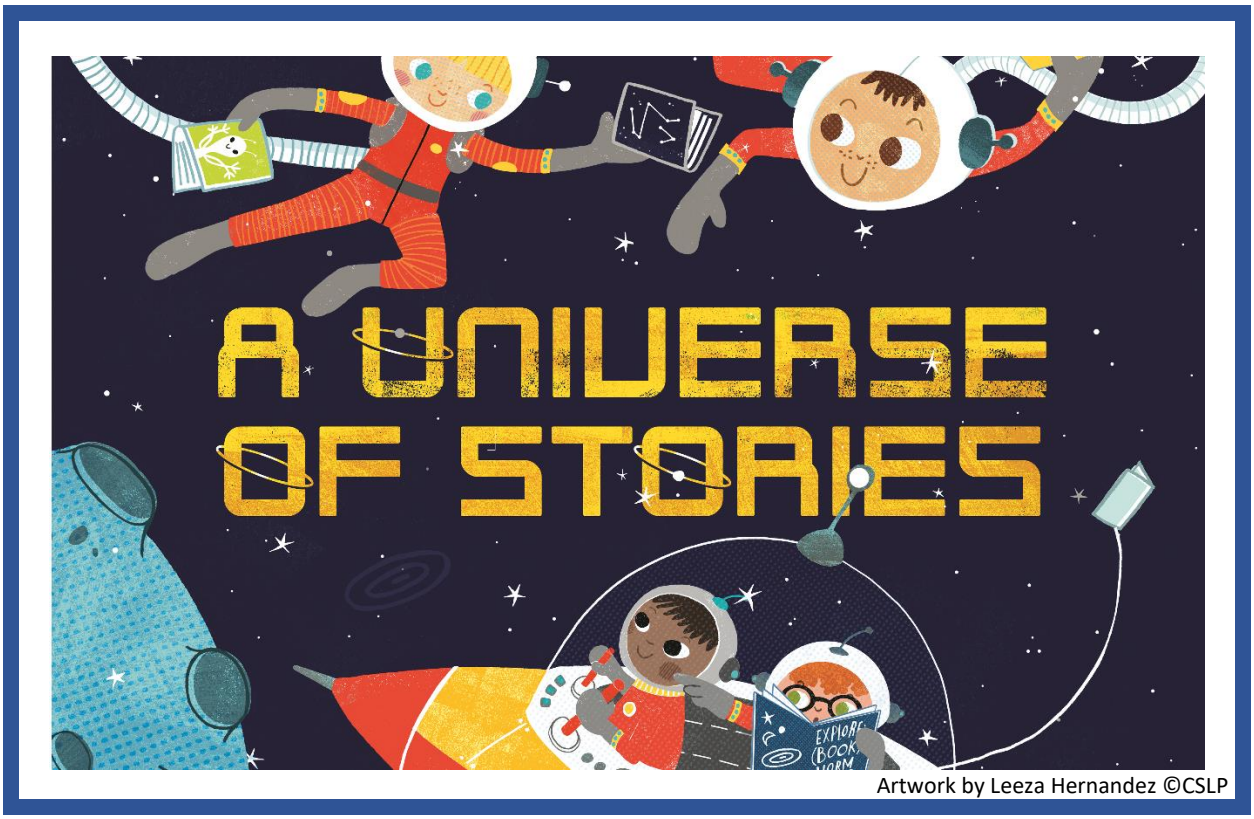

Artwork by Leeza Hernandez ©CSLP

2019 Summer Health Programming Manual

Developed through a partnership between the Collaborative Summer Library Program

and the National Network of Libraries of Medicine

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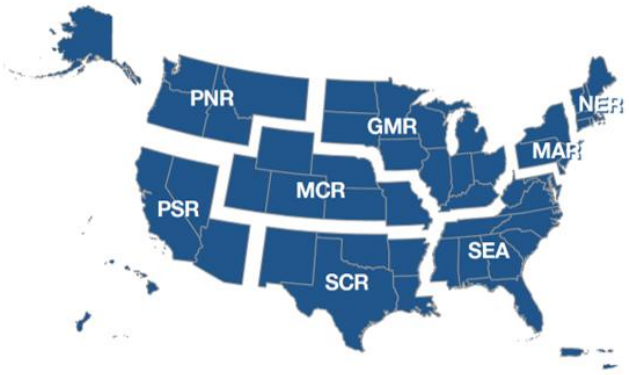
Introduction: The National Network of Libraries of Medicine

https://nnlm.gov

The National Network of Libraries of Medicine (NNLM) is a national program funded and coordinated by the National Library of Medicine (NLM), an Institute of the National Institutes of Health (NIH) in Bethesda, Maryland. The goal of the NNLM is to advance the progress of medicine and improve public health by providing U.S. health professionals with equal access to biomedical information and improving individual's access to information to enable them to make informed decisions about their health.



Eight Health Sciences Libraries function as the Regional Medical Library (RML) for their respective region. The RMLs coordinate the operation of a Network of Libraries and other organizations to carry out regional and national programs. The RMLs ensure a continuity of quality service for core programs of the NNLM, and cooperatively design, implement and evaluate innovative approaches to serve the health information needs of health professionals and a diverse public. Additionally, there are five NNLM National Offices, which serve all members in all eight regions. These offices are the NNLM DOCLINE Coordination Office (NDCO), the NNLM Web Services Office (NWSO), the NNLM Training Office (NTO), the NNLM Evaluation Office (NEO), and the NNLM Public Health Coordination Office (NPHCO).

The overall program is coordinated by the NLM's National Network Coordinating Office (NNCO). Further the National Network Steering Committee (NNSC), composed of NNCO staff and representatives from each RML, the NNLM National Offices, and NLM staff implements common operational and evaluation processes for the RMLs and NNLM National Office programs they coordinate.

Funding Opportunities

https://nnlm.gov/funding

The NNLM funds projects that improve access to health information, increase engagement with research and data, expand professional knowledge through its educational program, supports outreach and community engagement and promotes awareness and use of NLM resources. Each of the eight RMLs offers funding awards to libraries, community-based organizations, public health professionals, health educators, faith-based agencies and other NNLM information partners.

The NNLM also offers proposal writing resources and information.

https://nnlm.gov/funding/support#toc-2

The NNLM staffs teach a *Grants and Proposal Writing* class which is designed for beginning grant proposal writers. The class gives a general overview of the grant and funding processes as well as the level of detail required in a successful proposal.

https://nnlm.gov/classes/grants-and-proposal-writing

Examples of NNLM Funded Projects

Health in the Rockies is a public library project, funded by the MidContinental Region (MCR) at the University of Utah in Salt Lake City. The project goal is to make healthy eating fun, tasty and not intimidating. A local chef is teaching classes to both children and adults on healthy cooking as well as preparing meals and snacks. The class includes a presentation on the health information resources of the National Library of Medicine such as MedlinePlus.

Sensory Storytime is an initiative of a county public library system. Funded by the Middle Atlantic Region (MAR) at the University of Pittsburgh, the project provides meaningful early literacy experiences for children who may have sensory processing or autism spectrum disorders and their families, who would benefit from a story time that is designed to meet the needs of this special population.

Training Opportunities

https://nnlm.gov/classes

The education and training mission of the NNLM is to offer high-quality, innovative instruction to diverse audiences nationwide in support of the effective use of the NLM Information products and services and to provide the public with the health information needed to make them informed consumers.

NNLM course materials are copyright free and may be modified for individual use. The complete class including instructor scripts, PowerPoint presentations, handouts and exercises are available on both the NNLM national and regional websites. RML and their NNLM outreach partners will also teach courses for free either online or in-person.

The Training Schedule and Calendar on the NNLM Website contains a list of upcoming nationally available NNLM training opportunities and when and where they will be offered. Anyone may register and participate in an NNLM class.

https://nnlm.gov/training

https://nnlm.gov/calendar

Examples of NNLM Classes

Astronaut Health: Science Education Resources
https://nnlm.gov/classes/astronaut_health
The class introduces school librarians, public librarians, science educators and other participants to health science education resources from the National Library of Medicine, the National Institutes of Health and the National Aeronautics and Space Administration (NASA). The resources pertain to subjects such as K-12+ science education focusing on anatomy, genetics, health and health sciences careers.

Are You Ready? Essential Disaster Health Information Resources for Keeping Your Loved Ones Safe
https://nnlm.gov/classes/areyouready
The class covers the NLM disaster health information and other emergency preparedness resources for community educators, families, friends and caregivers. Included are resources for special needs populations. Participants may be consumers, librarians, pre-hospital responders, health care professionals, first-responders, and/or disaster preparedness administrators.

Join the NNLM

Public libraries may become members of the NNLM. The NNLM welcomes libraries, information centers and others who provide access to health information to the public. Network membership is free and offers a variety of benefits and services.

Network Membership offers:

- Funding for projects
- Training and other educational opportunities
- Traveling exhibitions
- Educational materials on health information

And it's all FREE!

For more information:

https://nnlm.gov/members

https://nnlm.gov/members/join-network

The NNLM looks forward to supporting, collaborating and working with our public library partners.

We Are All Made of Stardust

Activity #1: Stardust Playdoh

The atoms in all of our bodies and on Earth, came from stars that exploded across the galaxy a long, long time ago.

"Almost every material and resource we know of was created from elements born in stars, including those found in living creatures – which means you"! (Dart of Physics, http://dartofphysics.ie/physics-darts/we-are-all-made-stardust).

Preparation

This activity will be best done in a multipurpose room or a room with tables and floors that are the easiest to do clean up. Participants may wish to take the playdoh home with them.

Optional: Have participants bring their own containers or have plastic baggies available for them to take the playdoh home (or any other container of your choice).

Warning: Science can be messy, but also fun! Do warn the children not to eat the playdoh, especially if glitter or other items are involved.

Materials

Each group will need the following (have teens measure on their own). The flour, salt, and water can be halved if needed and will still create enough for individual participants:

- Two bowls – at least one medium to large (paper or plastic)
- 2 spoons or wooden craft sticks for mixing
- Measuring cup
- 1 cup of flour (have a little extra on hand)
- ¼ cup salt
- ½ cup warm or tap water
- Food coloring – have different colors available (can use liquid or gel)
- Glitter (stardust)
- Star shaped cookie cutters
- Ziploc bags for storing

Instructions

Refer to the discussion points and questions in the Observation and Results section below, as you go through the steps to make the playdoh.

1. Measure out 1 cup of flour. Transfer the flour to an empty bowl.
2. Measure out ½ cup salt and pour into the bowl with the flour.
3. Mix flour and salt in one bowl until well distributed.
4. In a separate bowl, add ½ cup of water.
5. Add a few drops of the food coloring into the water and mix until it is fully dissolved.
6. Begin to slowly add the water to the flour/salt mixture while stirring.
7. Stir until it is well combined, then have the participants begin to knead the dough with their hands until all of the flour is mixed in.
8. If the dough sticks, add more flour until the desired consistency is reached.

Once the dough is made, feel free to get creative:

9. Sprinkle and mix in a little “Stardust” (glitter).
10. Use star-shaped cookie cutters to cut out playdoh into star shapes.
11. Have groups share so that they can mix playdoh colors, create new colors or swirls!

Observations and results

For each step in the instruction, ask the companion questions below:

1. How are flour and salt alike? How are they different? What happens when they mix?
Could we separate them after they’ve been mixed?
Answer: Theoretically yes, we could separate them with a very fine filter, strainer or sifter.

For Teens: After we have put the salt in with the flour and stirred it, is this a mixture or a solution?
Answer: Mixture, because we have mixed two substances that can be separated.
2. What do you think will happen when we add the food coloring to the water? Now that we have put the food coloring drops into the water, do you think we could separate out the food coloring from the water?
For Teens: Is this a mixture or a solution?
Answer: The food coloring dissolved in the water, so it is a solution.
3-5. Now that we have combined the flour, salt, water, and food coloring, what happened?
Answer: A new substance has been formed, it would be very hard to separate now.

Explore some more: NLM resources for K-12 Chemistry and Biology

- Genetics Home Reference at https://ghr.nlm.nih.gov/
- ChemIDplus at https://sis.nlm.nih.gov/chemical.html
- Environmental Health Student Portal at https://kidsenvirohealth.nlm.nih.gov
- MedlinePlus Anatomy Health Page at https://medlineplus.gov/anatomy.html

Activity #2: Stardust Jars

Make some Pinterest-worthy “stardust” jars that teens can use as décor! The jars can also be used as “calming jars” and are fun to shake and watch swirl.

Preparation

This activity will be best done in a multipurpose room or a room with tables and floors that are easiest to clean up. Participants may wish to take the jars home with them.

Warning: Science can be messy, but also fun! Glitter can get everywhere, use at your own risk.

Materials

The amount of the ingredients will depend on the size of the jar you are using. Measurements are given in relative proportions for one jar. Multiply by number of jars that will be made.

- A jar with lid (plastic or mason jars)
- Funnel (groups can share)
- Mixing utensil (ex: wooden coffee stirrers, craft sticks or spoons)
- Water (enough to fill half a jar)
- Food coloring
- Fine or regular glitter (not needed if you use glitter glue)
- Star Confetti
- Dish soap (if needed, will only require a few drops)
- Choose one of the following as your main medium: baby oil, clear school glue, or glitter glue (enough to fill half a jar)

On choosing your main medium; it might easier or harder to distinguish the layers of separation at different points, depending on which medium is used. Recommendation to have each group use a different medium and compare the three as the jars are made.

Instructions

1. Using the funnel OR carefully pouring directly from the bottle, pour the medium chosen into the jar until about half full.
2. Fill the rest of the jar with water until about ¾ full.
3. Add a few drops of food coloring to the water portion and mix the food coloring into the water with a mixing utensil (spoon or craft stick).
4. Using your mixing utensil, mix all of the contents in the jar until evenly distributed.
5. Let it sit for about 30 seconds to a minute and observe how the mixture is separating.
6. Add glitter in small amounts, about half a teaspoon, while mixing until satisfactory (skip this step if using glitter glue as your medium).
7. Sprinkle a few spoonfuls of the star confetti into the jar and mix.

8. Now that all items are added, fill the rest of the jar with water until mostly full.
9. Close the jar tightly with the lid. Check to make sure the lid is secure.
10. Shake the jar to see the stars and glitter swirl!
11. Observe as the confetti and glitter settle to the bottom of the jar, and then shake again!
12. Optional: Add a few drops of dish soap if the glitter isn't moving well enough.

Observations and Results

For each step in the instruction, ask the companion questions below:

Steps 1-2. What happens when the oil and water mix? When the glue and water mix?
Could we separate them after they've been mixed? Is this a mixture or a solution?
Answer: When the baby oil and water are combined, it is a mixture because we have mixed two substances that can be separated.

Step 3. What do you think will happen when we add the food coloring?
Do you think we could separate out the food coloring from the liquid?
Is food coloring, when added to just the water, considered a mixture or a solution?
Answer: Food coloring dissolves in water, so it is a solution.

Steps 4-11. Now that we have combined all of the substances, what happened?
Answer: We created both mixtures and solutions at different steps of the process. The final product will likely be a suspension, depending on what type of ingredients you use.

A suspension is a heterogenous mixture that contains solid particles large enough to fall to the bottom or "settle out" upon standing. This collecting at the bottom is also called sedimentation.
For example, the star confetti and glitter particles are large enough to swirl around, but then eventually fall to the bottom of the jar when you let it sit for long enough.

NLM resources for K-12 Chemistry and Biology

Genetics Home Reference at https://ghr.nlm.nih.gov/
ChemIDplus at https://sis.nlm.nih.gov/chemical.html
Environmental Health Student Portal at https://kidsenvirohealth.nlm.nih.gov
MedlinePlus Anatomy Health Page at https://medlineplus.gov/anatomy.html

See the National Library of Medicine page for more resources!
https://www.nlm.nih.gov

Bubbles in Space!

Astronauts conduct all sorts of fun experiments while they are on the International Space Station. Join in on the fun! See how bubbles react differently in space then they do on Earth by watching the NASA video of bubbles on the space station, then create your own bubbles here on Earth!

Astronaut Karen Nyberg, Expedition 36 Flight Engineer, with a bubble on the Unity Node of the International Space Station (ISS).

NASA's Marshall Space Flight Center channel on YouTube has a fun video of astronauts with bubbles in space, that can be viewed before or after the "Blow the Biggest Bubbles" activity. The video link is here:
https://www.youtube.com/watch?v=9ZEdApyi9Vw

The 3-D Version of the same video can be found here:
https://www.youtube.com/watch?v=bxE09URykdg

Viewers will need red-blue stereoscopic 3D vision glasses to view the 3-D version of the video.

Use the activity "Blow the Biggest Bubbles" from the NIH resource, The National Institute of Environmental Health Sciences, Kids Health pages, found here:
https://kids.niehs.nih.gov/activities/science-experiments/blow-the-biggest-bubbles/index.htm

NIEHS Homepage:
https://www.niehs.nih.gov

NIEHS Kids Environment Kids Health Homepage:
https://kids.niehs.nih.gov

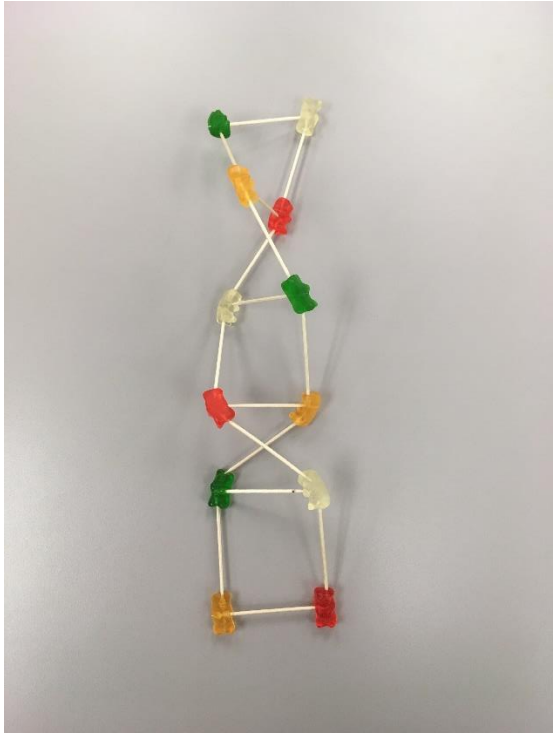
Incredible, Edible, DNA

DNA in Space! You can join scientists in this research. As one example, students in 7th to 12th grade are designing DNA experiments that address challenges in space exploration, through the Genes in Space program: https://www.genesinspace.org

Some of the experiments developed by students are selected and are taken to the International Space Station to find the answers to questions like:

How will a deep space mission affect our DNA?

Will space travel impact our eyes, bones, or other organs?



So… what is DNA?

For younger children, have a story time using any of the books below to explain DNA to the participants. You may also use a book of your choice, as long as it explains what DNA is.

- *The Baby Biochemist: DNA* by Margot Alesund
- *Have a Nice DNA* by Fran Balkwill and Mic Rolph

For older children, use the information below. You can distribute the information on note cards and have participants read a bullet point each or have these up on a board or screen.

We will get our answers from Genetics Home Reference, a resource from the National Library of Medicine:
https://ghr.nlm.nih.gov/

1. DNA stands for deoxyribonucleic acid.
2. DNA is a biomolecule that holds the blueprint for how living organisms are built.
3. DNA is made out of four bases - or units - called nucleotides: A, C, G, and T.
4. Each base has a pairing partner or a "base pair".
5. "A" will pair with "T" and make a base pair.
   "C" pairs with "G" to make a base pair.
6. Many, many of these pairs connect in two long strands that also have connecting steps to form a ladder that looks like it has been twisted – it is called a *double helix.*
7. DNA contains complementary genetic information (like a picture and its negative).

Materials

- Multi-colored candy – 12 for each person or group (3 sets of four different colors)
- Toothpicks – 16 for each person or group
- Paper or note card
- Pencil

Note: The candy for this activity should be available in four different colors, to make three sets (for example: 3 yellow, 3 red, 3 blue, 3 green). These can be gummy bears, small marshmallows, or any type of candy that will stick into a toothpick easily.

Instructions

1. Each participant requires 12 pieces of candy, making sure that there are 4 different colors represented to make three sets (for example: 3 yellow, 3 red, 3 blue, 3 green).
2. Line up 4 candy pieces in a row, making sure that each one is a different color.
3. Create two more rows, making sure that the same 4 colors are represented.
4. Make your own key by assigning a color to each letter - "A", "C", "G", and "T". Record the assignments on your piece of paper or notecard.

5. Begin connecting the candy with toothpicks by inserting the toothpick into the first candy's side. This is your "primary" candy.
6. Using your key, select a second candy that would be the base pair for your primary candy. For example, A pairs with T. C will pair with G.
7. Take that selected second candy from Step 6 and insert a toothpick into its side. Then insert the other end of the same toothpick into the primary candy's side.
8. Repeat steps 5-7 for the rest of your gummy line to complete the base pairs.
9. You should now have 6 pairs of candy connected.
10. Begin connecting your pairs of candy vertically with toothpicks to create a 'ladder' with rungs. Insert a toothpick into the bottom of a candy and another toothpick to its pair.
11. Repeat with the remaining base pairs, but not the last pair.
12. Connect all of the base pairs by inserting the open ends of the toothpicks into a complementary pair to create a ladder shape, ending with the last pair at the bottom.
13. Make sure the connections or "rungs" are all securely in place and sturdy.
14. Hold the top and bottom candy pieces and toothpick "rungs". Twist the ladder until you have a shape similar to a double helix.

Observations and Results

Discussion point: DNA contains complementary genetic information, like a picture and its negative.

- Do you see a pattern as you create your DNA?
- Were you able to make your DNA into a double helix?
- What other experiments could you do to learn about DNA?
- What kind of experiments would you want to send to space?

Resource List

The Materials and Instructions sections were inspired by the "Yummy Gummy DNA" activity from Genome Research Limited at YourGenome.org, a resource which was found via NLM's GeneEd website. YourGenome.org at https://www.yourgenome.org

Suggested NLM Resources on Genetics and DNA

Genetics Home Reference: https://ghr.nlm.nih.gov/

Harry Potter's World: Renaissance Science, Magic, and Medicine
https://www.nlm.nih.gov/hmd/about/exhibition/harrypotter-bookinfo.html

Food in Space: How to Make "Space" Meals

What do the astronauts eat during the time they live in space? Astronauts eat the same foods in space that they [and we] do on earth. They need a well-balanced diet to maintain their health and fitness just as we "earthlings" do. The proteins, carbohydrates, fats vitamins and minerals in food provide the nutrients and energy all of us need to stay healthy.

Suggested Activity:

Show NASA YouTube videos on food, food preparation and eating in space (see Videos). Then try preparing a "space" meal by using freeze-dried foods, tortilla "sandwiches" and other combinations of prepackaged foods.

Offer the NNLM course, **Food for Thought: Exploring Nutrition Information Resources** class either in-person or a group online course. The class may be taught by a librarian. The course materials including an agenda, script, PowerPoint presentation and participant exercises. The course can be taught from 1 hour to 4, depending on the time available. The course materials are available for free. None of the materials are copyrighted so they may be modified and adapted. Invite a nutritionist in to present on healthy meals, dietary needs and nutrition. Food for Thought: Exploring Nutrition Information Resources - https://nnlm.gov/classes/nutrition

Suggested Videos

Cooking in Space: Whole Red Rice and Turmeric Chicken - https://www.youtube.com/watch?v=4exaXdPKS3Y

Peanut Butter and Jelly in Space -https:/www.youtube.com/watch?v=Z2szk-NuKWg

Pizza Night! - https://www.youtube.com/watch?v=z74OwRy8o9I

Dining on the Space Station - https://www.youtube.com/watch?v=PLmc6CJQwLM

How to Recycle Water in Space - https://www.youtube.com/watch?v=5ZYQMRucmS0

Growing Food (Red Romaine Lettuce) - Space Station Live: How Does Your Garden Grow in Space - https://www.youtube.com/watch?v=SgpU08WJm0c

Space Station Live: Everything's Coming up Veggie (or Flowers) - https://www.youtube.com/watch?v=9JDAZBoLJUc

Space Station Live: Cultivating Plant Growth in Space - https://www.youtube.com/watch?v=9MfWARdoF-o

Your Family, Your History, Your Health

The Kelly twins are the only identical twin astronauts in history. And identical twins have the same genetic code. NASA scientists found this to be an excellent research opportunity to study the genes of twins. Thus, the Twin Study was designed [NASA Twins Study [https://www.nasa.gov/twins-study]. Researchers took and analyzed biological samples taken from each twin before, during and after their missions. Compiling comprehensive genetic profiling on the Kelly twins has produced some interesting results.

Genes are the building blocks of inheritance. Passed from parent to child, they contain DNA (Deoxyriboneucleic acid) the instructions for needed to develop and direct the activities of nearly all living organisms. DNA molecules are made of two twisting, paired strands, often referred to as a double helix. DNA contains the information needed to build the entire human body.

A genome is the entire genetic material in an organism. It is made of DNA and includes genes and other elements such as proteins that control the activity of those genes. The human genome is mostly the same in all people. But there are variations across the genome. This genetic variation accounts in appearance and health. People who are closely related have more similar DNA.

Suggested Activities:

- Fill in your family tree. Learn about inheritance and genetics. Then hold a discussion on inheritance.
- Offer a workshop on basic genetics taught a local genetics counselor or teacher.
- Offer the NNLM class: The ABCs of DNA: Unraveling the Mystery of Genetics Information Consumers. Note: Your Regional Medical Library can assist you with finding an instructor. https://nnlm.gov/classes/abcs-dna
- Have participants read, The Immortal Life of Henrietta Lacks by Rebecca Skloot. Then have a discussion session on the social, legal and ethical side of implications of genetic and genomic research and its implications.

Contact your Regional Medical Library for assistance. The RML may also be able to assist with finding a health professional who specializes in genetics to teach a workshop or do a presentation.

Resources:

Genetic Alliance - Family History Tools: http://www.geneticalliance.org/fhh

Mayo Clinic - How to Compile Your Family History:
http://www.mayoclinic.com/health/medical-history/HQ01707

U.S. Surgeon General's Family History Initiative:
https://www.hhs.gov/familyhistory

National Institute of General Medical Sciences:
https://www.nigms.nih.gov/Education/pages/Factsheet_studyinggenes.aspx

The New Genetics:
https://publications.nigms.nih.gov/thenewgenetics/thenewgenetics.pdf

(Note: Free booklet that can be downloaded and/or copied. Or ordered from NIH: https://publications.nigms.nih.gov/order/index.htm#thenewgenetics)

Your Guide to Understanding Genetic Conditions: https://ghr.nlm.nih.gov/

ABCs of DNA: Unraveling the Mystery of Genetics Information for Consumers: https://nnlm.gov/classes/abcs-dna

All of Us: https://www.joinallofus.org/en/program-overview

Games

Scitable: http://www.nature.com/scitable

Science2Discover: Solve Genetics Cases:
http://www.science2discover.com/solvethecase.htm

Click and Clone:
http://learn.genetics.utah.edu/content/cloning/clickandclone/

Genetic Jeopardy: http://www.superteachertools.com/jeopardyx/jeopardy-review-game.php?gamefile=1297971268