EXCELLENCE IN SCIENCE AWARD PROGRAM



GRADES 6-8 BADGE WORKBOOK



MENSA FOUNDATION EXCELLENCE IN SCIENCE AWARD PROGRAM



To encourage curiosity and exploration in STEM-related fields, the Mensa Foundation has developed the **Excellence in Science Award Program** - complete science activities, earn a commemorative certificate in recognition of your outstanding achievement and get an Excellence in Science T-shirt, too!

The Mensa Foundation recognizes and encourages education, gifted youth, and lifelong learning through resources like the Mensa for Kids website and other programs for youth and those who support them.

While these activities were written or selected for children in grades K-12, this program is open to all (including parents and teachers!) – the only requirement is an interest in science.

Inspired by the principles of the Next Generation Science Standards (NGSS), the *Excellence in Science* program invites learners to complete hands-on, research-based, creative, and real-world activities across a variety of science topics. The Mensa Foundation aims to help every participant build a lasting passion for science, one badge at a time.

To participate in the Mensa Foundation Excellence in Science Program, follow these steps:

- 1. Select a workbook from the grade level bands available. Participants can choose any workbook that best fits their skills and interests.
- 2. Print the appropriate workbook and track each activity you complete by checking it off as you go. When you finish all the activities for a given badge, record the completion date on your badge sheet. Please complete the form by hand. We operate on the honor system, and we encourage honesty in this way.
- 3. Once you've completed an entire workbook by finishing every badge, both the participant and an adult will need to sign the badge sheet as verification and return it and the order form to the Mensa Foundation at the address provided. Once we've received your signed badge sheet and verified it, we'll send you a recognition certificate and T-shirt. Please allow 6 weeks for delivery.



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MENSA FOUNDATION EXCELLENCE IN SCIENCE AWARD PROGRAM

Important Questions Answered

Is Mensa membership required?

No, the program is open to anyone, regardless of Mensa affiliation or membership.

Do I have to use the workbook for my grade level?

No, participants can pick the workbook that's best for them.

Do I have to complete the activities exactly as written?

No, feel free to make adjustments to any activity as needed. This program is meant to be flexible and inclusive – if you can adapt the activity while keeping the scientific concepts intact, go for it!

Do I need to complete the activities in order?

No, activities can be completed in any order. Just make sure all badge requirements on the list are checked off before submitting your form.

Do I have to submit my completed projects?

No, all you need to submit is your signed badge sheet. We operate on the honor system, and we trust parents/teachers to verify that each badge was completed in its entirety.

Can the same activity be used satisfy multiple badge requirements?

Yes, we recommend reading the workbook in its entirety before you begin so you can make note of any activities that can be combined or modified to use across two or more badges.

Can I redo the program if I already completed it at a younger grade level?

Yes! We encourage participants to continue exploring science at any age or level, and we're happy to issue additional awards for each new badge workbook completed.

Can school projects or classroom assignments count toward badge activities?

Yes, if a school project or classroom activity aligns with one of the badge requirements, it absolutely counts.

I'm a teacher - can I swap some of these for similar activities that are already part of my school curriculum?

Please do! We trust teachers to make the right decisions for their students' educational needs while maintaining the integrity of the Excellence in Science Award Program.

If a teacher does an activity with the whole class, does every student in the class get credit for completing the activity?

Yes, as long as the student is present for the activity. Students who are absent must complete the activity another time before checking it off their workbook.

Can a teacher/parent submit a form and be recognized as well?

Of course!

Will you send my students' awards to our school?

Yes, just include your school's name, address, and who to attention it to.

Do you ship awards internationally?

Yes! We're happy to send certificates and T-shirts to participants outside the U.S. Please note that international delivery may take longer than the standard 6-week timeline.

The pages that follow contain the activities for each Excellence in Science badge. These activities are designed to help you explore science through hands-on experiments, creative projects, and real-world investigations.

There are 10 badges needed to complete the Excellence in Science Award Program:

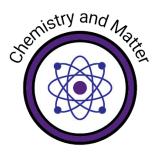
- Chemistry and Matter
- Earth and Space Science
- Energy
- Engineering
- Forces and Motion
- Life Sciences
- Sound, Light, and Waves
- Science Literacy
- Science Exploration
- Arts and Science

Complete each activity to the best of your ability. You don't need to be perfect; the most important thing is to have fun, stay curious, and try something new. Some activities include suggested links to websites with examples, videos, or how-to instructions.

If you're viewing this workbook on a screen, you can click those links directly. If you're using a printed workbook, **scan the QR code below** to visit a webpage with all the activity links in one place. If you experience any issues with the QR code or links provided, please let us know by emailing giftedyouth@mensafoundation.org.

Look for the symbol next to activities that have a suggested online resource.





CHEMISTRY AND MATTER

Use these activities to reinforce learning concepts related to matter, how it behaves, and how different substances interact. Learn about elements, atoms, and chemical reactions, and understand the difference between physical and chemical interaction. Check off each activity as you go, and when you've completed them all, record the date on your badge sheet.

Understand properties, history, and uses of elements on the periodic by completing one of the following: Select an element and create an infographic about it Select at least five elements and create trading cards for them, using key facts about their properties, uses, and discovery history as stats. 	
Understand how atoms combine to form molecules and compounds by constructing 3D models (using candy or clay and toothpicks) that illustrate atomic structure and bonding. Choose three different molecules or compounds to model.	
Create a digital or paper collage, poster, infographic, or other visual representation showing how chemistry shows up in everyday life. Examples might include toothpaste, soap, cooking, batteries, or sports gear. Label each entry with information about the chemistry behind it.	
Create a safety poster or instructional video for a middle school science lab. Include common chemical hazards, safe lab behavior, and symbols for things like corrosive or flammable substances.	
Investigate states of matter beyond solids, liquids, and gases. Research additional states like plasma or Bose-Einstein condensates and explain how scientists create and study them. Present your findings in the form of an essay, blog post, presentation, poster, infographic, or video.	
Explore how different mystery powders (baking powder, baking soda, cornstarch, and powdered sugar) react when mixed with water, vinegar, and iodine, and investigate whether each reaction is physical or chemical based on your predictions and observations.	
Discover how different liquids interact by mixing combinations like oil, water, honey, and rubbing alcohol to explore their miscibility and density, then observe how they layer, separate, or blend over time	

6-8 Badge Activities

	gate how chemical reactions can be influenced by physical properties by eting one of the following:
0	Altering a chemical reaction by changing a variable's temperature
0	Altering a chemical reaction by changing a variable's size
an egg	er how salt changes water's density by testing how much salt is needed to make float. Observe buoyancy in action and explore how this principle connects to real-places like oceans and salt lakes. \Box
	e a cooking or baking process (like making bread or caramelizing sugar) and ch the chemical changes involved. Document each step and identify the science I it.
DATE COMPLE	ETED:



EARTH AND SPACE SCIENCE

Use these activities to reinforce learning concepts related to our planet, its place in the solar system, and its relationship with the moon and the sun. Learn about Earth's systems and processes, how landforms change over time, and how people and the environment impact each other. Check off each activity as you go, and when you've completed them all, record the date on your badge sheet.

	Pick a movie, tv show, or book that portrays space exploration. As you watch/read, make note of which things are portrayed accurately and which things are not portrayed accurately.		
	Research a past or current space exploration mission. Make note of key figures, important dates, mission objectives, challenges, and outcomes. Then, present your findings as a paper, poster, infographic, presentation, or video.		
	Create a visual representation of Earth and its place in the solar system by completing one of the following:		
	 o Make a scale model of the solar system □ 		
	\circ Build a 3D model of the solar system \square		
	Demonstrate the process of the rock cycle using crayon shavings, water, and aluminum foil. □		
П	Build your own weather tools by completing one of the following:		
	 Make a rain gauge using a plastic bottle □ 		
	Make a barometer using a jar, a balloon, and a straw		
	Make an anemometer (wind speed meter) using paper cups and straws		
	Design a solution to help people survive in one of Earth's most extreme climates by researching environmental challenges, then creating and presenting a product (real or imagined) that uses science to improve human comfort and safety. Present your findings in the form of an essay, blog post, presentation, poster, or video. Examples of extreme climates include:		
	o Sahara Desert		
	o Antarctica		
	o Sohra, India		
	 Atacama Desert 		

Death Valley

Oymyakon, RussiaLa Riconada, Peru
 Explore how human actions affect fragile ecosystems by researching a threatened region and developing a science-based plan to help protect it. Present your findings in the form of an essay, blog post, presentation, poster, or video. Examples of threatened regions include: The Andes Mountains The Great Barrier Reef The Amazon Rainforest The Arctic Tundra
 Demonstrate an understanding of Earth's geologic history by completing one of the following: Design a travel brochure that promotes a specific geologic time period as an exciting destination, highlighting its unique environmental features, dominant lift forms, and notable events. Construct a diorama that represents a specific geologic time period, highlighting its climate, landforms, flora, and fauna.
\square Visit a local park or neighborhood and document signs of erosion or weathering with photos and notes.
☐ Create a rock collection and identification guide. Label each sample, include a physical description, and explain how it is formed.
DATE COMPLETED:

Energy - H

ENERGY

o Fossil fuels (coal, oil, natural gas)

Nuclear energyWind energy

Use these activities to reinforce learning concepts related to energy. Learn about the types of energy, where they come from, and how they are transferred, and explore how energy moves through systems, powers technology, and impacts people and the environment. Check off each activity as you go, and when you've completed them all, record the date on your badge sheet.

Explore how stored elastic potential energy in a rubber band converts into kinetic energy and demonstrate principles of mechanical energy and motion by completing one of the following: o Build a rubber band car o Make a popsicle stick catapult o Build a rubber band paddleboat
Make a chain reaction using a <u>popsicle stick cobra weave</u> to explore how potential energy is stored through tension and rapidly transformed into kinetic energy. \Box
Explore how solar energy can be converted into mechanical energy by making a $\underline{\text{solar}}$ $\underline{\text{updraft tower}}$. \Box
Test which materials are most effective for $\underline{\text{insulating ice}}$
Explore the conservation of energy and transfer of energy by completing one of the following: Make a paper roller coaster Build your own Rube Goldberg machine using household objects Make and test a simple Newton's cradle
Research different energy sources (solar, wind, hydro, nuclear) and create a video, infographic, or model explaining the pros/cons of each. Examples of energy sources might include: The sun (solar energy) Water (hydroelectric energy) The Earth (geothermal energy) Organic materials (biomass energy)

Ш	☐ Investigate thermal energy transfer by completing one	of the following:
	 Design and build an insulated cup to minimize 	
	different materials to see which conserves the	e most heat.
	 □ Investigate how energy is used in everyday life and der efficiency and reduce waste by completing one of the formula of the following of the following in the following is a second of the following is a s	ollowing: ek. Monitor how often lights, e a chart and propose ways to
	might be wasted (leaky windows, lights left or solutions in a written or visual report.	
	Research a real-world energy crisis and create an artic infographic, or video explaining the problem and possi	
	crises may include:	
	 1973 oil crisis 	
	 1990s Armenian energy crisis 	
	 2021 Texas power crisis 	
	 Nigerian energy supply crisis 	
TF (TF COMPLETED:	



ENGINEERING

Use these activities to reinforce learning concepts related to engineering. Learn about the history of engineering and how it's changed over time and understand the engineering process and how it's used to solve real-world problems. Check off each activity as you go, and when you've completed them all, record the date on your badge sheet.

Create an infographic about the engineering design process. Research the steps (Ask, Imagine, Plan, Create, Test, Improve) and create a visual explaining how each part works with real-world examples.
Explore engineering fields and design a career poster. Research different branches of engineering (e.g., civil, aerospace, biomedical, environmental) and make a poster, infographic, presentation, or other visual guide explaining what each does.
Redesign a real-world structure to improve it. Pick a famous structure and research how it was built. Then sketch a version with improvements using modern materials or techniques. Examples of famous structures include: The Eiffel Tower Hoover Dam The Golden Gate Bridge The Chunnel
Analyze an engineering failure and suggest fixes. Research a famous failure and explain what went wrong and what engineers learned from it. Present your findings in an essay, blog post, presentation, or video.
Apply the engineering design process to identify a real-world problem in your home, school, or community and develop a prototype solution by completing the following steps: o Identify a challenge o Brainstorm and design a solution o Build and test a prototype
 Build and test a prototype

o Describe how your solution could solve a problem or make a positive impact.

L Apply in	ie engineering design process by completing one or the rollowing:	
0	Build an aluminum foil boat that can float and carry cargo. Test and adjust your	
C	design to improve your boat's performance.	
0	Build an earthquake-resistant structure. Test and adjust your design to improve	
i	ts stability. \square	
0	Build a device that protects an egg from breaking when dropped from a height.	
٦	Test and adjust your design to improve its effectiveness. \square	
experim o l a v o l c c o l	how engineers solve real-world problems using creativity, critical thinking, and lentation by completing one of the following: Using straws, toothpicks/popsicle sticks, paper, and tape, build a structure that is least 5 inches tall and can support the weight of as many books as possible without collapsing. Using only paper and tape, design and build the tallest free-standing tower you can that can support the most weight without collapsing. Using only paper, string, popsicle sticks, and tape, build a bridge that can span a one-foot gap and can hold as many pennies as possible without collapsing.	
that are	and make a list of at least 10 tasks that were previously performed by humans now performed by machines. Evaluate the impact on people's lives of having asks now done by machines.	
DATE COMPLETED:		



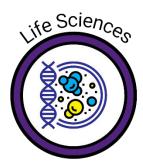
FORCES AND MOTION

Use these activities to reinforce learning concepts related to forces and motion. Explore the relationship between force, mass, and acceleration, learn to predict motion using physics principles, and apply your understanding of forces and motion to real-world situations. Check off each activity as you go, and when you've completed them all, record the date on your badge sheet.

door to	one day noticing and recording the forces acting around you, from pushing open a sitting in a chair. Identify where Newton's laws apply in ordinary life and write ntries or sketches to document them.
Earth v	a "space tourism" brochure comparing gravity and motion on two planets (e.g., s. Mars). Include things like walking, jumping, or riding a bike. What would daily el like with different gravity and mass? Use real planetary data and apply your tanding of mass, weight, and force.
Create a visual timeline showing how our understanding of motion and force has shaped how we travel, from wagons to rockets. Highlight breakthroughs like the wheel, the steam engine, the bicycle, or maglev trains. Include short descriptions of the physics principles behind each milestone.	
	how stored energy is converted into motion by designing and testing a vehicle ed by mechanical force. Complete one of the following: Design and build a balloon-powered car to explore how stored potential energy is converted into kinetic energy, and observe how Newton's Third Law of Motion applies as air escapes to propel the car forward. Test different variables like balloon size and added weight to see how they affect motion and speed. Build a mousetrap-powered car to explore how mechanical energy from a spring can be transferred into motion. Investigate how lever length, wheel size, and friction affect the distance and speed your car can travel.
	how magnetic fields create forces that interact with matter by completing one of lowing: Build a simple electromagnet and test it on metal objects in your home or classroom. Magnetize a needle and float it on water or suspend it with thread to find magnetic north.
0	Use strong magnets to make a small object float or glide.

6-8 Badge Activities

Ц	attaching different objects as payloads, and measuring how distance and speed are affected as the weight on the rocket increases.
	Use a stopwatch and tape measure to time yourself walking or running various distances. Plot your speed on a graph and see how it changes with different conditions (walking uphill, carrying a load, etc.).
DATE (COMPLETED:



LIFE SCIENCES

Use these activities to reinforce learning concepts related to life sciences. Learn about how living things grow, survive, and interact, and explore cells, body systems, genetics, and ecosystems. Check off each activity as you go, and when you've completed them all, record the date on your badge sheet.

	Explore the building blocks of life by completing one of the following:		
	0	Build a candy model of DNA and label its features.	
	0	Create a 3D model of a plant or animal cell and label its organelles and their functions.	
	0	Use household materials to isolate visible DNA strands from a strawberry. Record	
		your steps, observations, and reflect on how scientists study genes in the lab. \Box	
Explore organisms and their role within an ecosystem by completing one of the following:			
	0	Build a terrarium with soil, insects, and other natural material needed to sustain life. Record the processes and interactions you observe.	
	0	Investigate how decomposers break down organic matter by making a compost	
		jar.	
	0	Collect water samples from nearby bodies of water, observe them under a	
		microscope, and use a guide to identify organisms like algae, bacteria, and	
		protozoa.	
	Observ	ve how plants produce oxygen during photosynthesis with a <u>leaf disk experiment</u> . \Box	
	Dissec	<u>t a flower</u> and identify and label its features. \Box	
	Resea	rch an invasive species and how it affects native species and the ecosystem	
	balanc	e. Present your findings in an essay, blog post, presentation, poster, infographic, or	
	video.	Examples of invasive species may include:	
	0	Zebra mussel	
	0	Cane toad	
	0	European starling	
	0	Kudzu	
	_	Common rabbit	

6-8 Badge Activities

Ц	life around your home, school, or local park. Include at least 10 species.
	Design a public health poster or public service announcement video about how diseases spread and how people can stay healthy.
DATE (COMPLETED:



SOUND, LIGHT, AND WAVES

Use these activities to reinforce learning concepts related to sound, light, and waves. Learn about how waves carry information, how waves travel through different materials, and how certain technologies rely on waves to function. Check off each activity as you go, and when you've completed them all, record the date on your badge sheet.

	rch a job that relies on understanding light or sound. Write a short summary or d a mock interview with someone in that field. Examples of jobs may include: Audio engineer Optometrist Sonar technician Lighting designer			
entry,	e a scientist like Isaac Newton, Galileo Galilei, or Heinrich Hertz. Write a journal comic strip, blog post, or video from their point of view about a discovery they in optics, sound, or wave theory.			
Explor	Create a written or visual research project about satellite communications. You'll need to include information about the history of satellite communications, how satellites function, what parts they contain, what waves they use to communicate, and what real-world uses they have. Your project can be a research paper, poster, slide deck, or video. Research one way satellites are used (weather forecasting, communications, navigation, urban planning, etc.) and imagine how life would be different if we no longer had satellites for that purpose. Present your findings in the form of a written paper, infographic, presentation, or video. Create a model of a satellite using household materials. Be sure to include an antenna for communication, a power source, and a control system for operations.			
Create a short video, infographic, comic, diagram, or other visual representation that explains wave types (mechanical vs. electromagnetic), showing how they travel and interact with different materials.				
Research and explain how animals use light and sound waves for hunting, navigation, and communication. Give at least three distinct examples. Then, select one and compare it with wave technology developed by humans (e.g., echolocation and sonar).				
Design a concert hall or movie theater. Sketch or digitally model a space optimized for sound or light quality. Include decisions about materials, angles, lighting, or acoustics, and explain your choices.				

6-8 Badge Activities

☐ Explore how different materials absorb or block sound by building a simple soundproofing test box. Use a decibel meter app to measure how well items like foam, fabric, or foil reduce noise, and discover which materials work best and why.
☐ Record and analyze sounds using a sound editing app (like GarageBand or Audacity) to record different noises and visually compare waveforms.
ATE COMPLETED:



SCIENCE LITERACY

Use the following activities to think and talk about science like a real scientist. You'll build skills like asking questions, analyzing what you see and read, and talking with others about scientific concepts. Check off each activity as you go, and when you've completed them all, record the date on your badge sheet.

Complete at least 7 of the following:

\square Keep a science journal while working on your badges to record your observations.
Read at least 10 science-related books. Write or record a video review of at least two books.
\square Make a list of at least 20 vocabulary words you learned while working on your badges.
\square Watch a science documentary or video and write or draw about something you learned.
\square Select a topic you learned about and design a poster or infographic about it.
\square Interview a scientist (or watch one in a video) and write about why their job is important.
☐ Teach a science concept to someone else or make a short video of yourself explaining a science concept.
☐ Read and summarize a science article from a reputable source (e.g., National Geographic for Kids).
\square Select a scientist and write a journal entry from their perspective.
☐ Write an article or blog post about how science has impacted you, your family, or your community.
☐ Select and research a popular science-related myth or misconception. Present your findings in a paper, blog post, presentation, infographic, or video.
DATE COMPLETED:



SCIENCE EXPLORATION

Use the following activities to connect science to the real world and see how science is used in everyday life. Check off each activity as you go, and when you've completed them all, record the date on your badge sheet.

Complete at least 5 of the following:

☐ Visit a science museum or natural history museum. Write or draw your favorite exhibit and explain what you learned.
☐ Visit a zoo, aquarium, or botanical garden. Observe an animal or plant and record 3 facts about it in your science journal.
\square Visit a planetarium or stargazing event. Write or draw about something you learned about space.
☐ Attend or participate in a science fair. Take notes on 3 interesting projects or present your own project.
☐ Take a nature walk or go on a hike. Collect data or take pictures of interesting rocks, insects, plants, or animals and describe them.
\square Do a virtual field trip to a science lab, museum, or NASA site. Reflect on something new you discovered.
☐ Interview a scientist, zookeeper, astronomer, or science educator about their work and share what you learned.
☐ Visit a farm or environmental center. Learn about ecosystems, food production, or conservation and write about it.
☐ Volunteer at or attend a science outreach event (e.g., STEM night, Earth Day festival, robotics competition).
Design your own science field trip—research and visit a local place of scientific interest and explain why it's important.
DATE COMPLETED:



ARTS AND SCIENCE

Use the following activities to blend scientific thinking with creativity and explore the beauty of science through artwork. Check off each activity as you go, and when you've completed them all, record the date on your badge sheet.

Complete at least 5 of the following:

Soundwave art

Make a nature journal with sketches and notes.				
Make an art piece out of recycled materials.				
Research a scientist and create a piece of art inspired by their work.				
Create a collage, photo album, or photo essay using pictures related to one of the scientific concepts you've learned.				
Create a calligram related to a science topic.				
Make a piece of digital data art using data collected from one of your experiments/projects.				
Create a wearable science project, such as a piece of jewelry or clothing, inspired by one of the scientific concept's you've learned.				
Write a poem, song, skit, or monologue related to one of the scientific concepts or science innovators you've learned about.				
Build a diorama of a science scene related to one of the concepts you've learned.				
Create a piece of process art using the scientific concepts you've learned so far. Examples may include:				
o Leaf prints				

6-8 BADGE ACTIVITIES

	nd illustrate a fiction story or record a short film about a science-related topic.
Examp	les might include:
0	The moon, stars, or planets
0	A severe weather event
0	A plant or animal that is native to your area
0	An invention that could change the world
DATE COMPLE	TED.

EIS-6-8-1 19



BADGE SHEET (GRADES 6-8)

Record the date you completed each badge, then sign below. Mail this page to the Mensa Foundation, along with your award order form. This page is required to receive your award.

Pits and Science	Cremistry and Market
and Space Stries	Energy
Engineering	Loces and Motion
ite Sciences	csce Exploration
science Literacy	College () () () () () () () () () (
	has completed all the activities required to earn each nce badge and that this record is true.
Participant's signature	Adult's signature

EXCELLENCE IN SCIENCE AWARD ORDER FORM



Thank you for participating in the Mensa Foundation's **Excellence in Science Award Program!**Participants who complete an entire badge workbook are eligible to receive a commemorative certificate and an Excellence in Science T-shirt.

We're excited to celebrate your achievement and love of science!

To receive your awards, complete this form and mail it along with your signed badge sheet to the address below. Both the badge sheet and order form are required to receive your certificate and T-shirt. Please allow up to 6 weeks for processing and delivery.

Send your badge sheet and order form to:

Mensa Foundation Excellence in Science 1315 Brookside Dr Hurst, TX 76053.

(Completed lists must be mailed. We do not accept scans or faxes.)

Scientist's Name				Scient	ist's Age	Mensa Membership Number (if applic	able)
House Address (City, S	State ZIP code)						
Email Address						Phone Number	
Scientist's T-shirt Size							
☐ Youth S	☐ Youth M	☐ Youth L	☐ Youth XL	☐ Adult S	☐ Adult N	I □ Adult L □ Adult ?	XL
Parent/Teacher's Name					Mensa Membership Number (if applic	able)	

