



BUILDING POSSIBILITIES

PATCH PROGRAM

**Girl Scouts of the Green and White Mountains
Serving New Hampshire and Vermont**

Updated 01/09 kag



BUILDING POSSIBILITIES

Do you have:

- *a love for solving puzzles?
- * a good imagination?
- * a passion for numbers?

The goal of this engineering patch program is to spark an interest in this awesome career field. After completing these activities you may realize you have what it takes to continue.

What is an engineer?

They are people like you who use their imagination and skills to solve real, physical, material, tangible problems to build a brighter future for all of us! Engineers have designed, created and improved everything from resealable sandwich bags to bionic arms to the space shuttle.

The word “engineer” comes from the same Latin root as “ingenious.” It means to craft or make things using cleverness.



The activities in this packet can be adapted for all age levels.
The requirements to earn the patch are as follows:

Daisies & Brownies

- 2 Discover Activities
- 2 Connect Activities
- 1 Take Action Activity

Juniors, Cadettes, Seniors & Ambassadors

- 3 Discover Activities
- 3 Connect Activities
- 1 Take Action Activity

After the requirements are completed please fill in the evaluation on the last page. Send the evaluation along with the patch order form to:

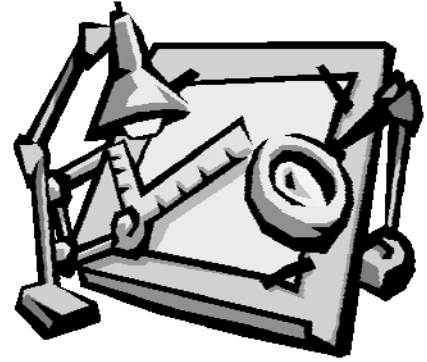
Girl Scouts of the Green and White Mountains (GSGWM)
PO Box 10832
Bedford, NH 03110-0832

Suggestion: Divide into small groups to do the different activities. Then you can show each other your accomplishments...or invite another Girl Scout group to your meeting.

DISCOVER ACTIVITIES

Girls Develop Positive Values

- Can you come up with an idea that would reduce the noise pollution of airplanes? Try to be realistic!



Girls Gain Practical Life Skills

- Using a pulley system, invent something to make your life easier. Can you think of a device that would help a disabled person who can't stand?
- Try to improve a communication device that is already being used. Make a prototype, or sample, that you can explain and show what your changes would be.

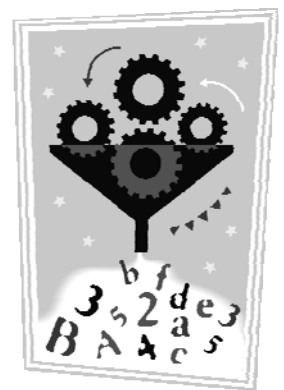
Girls Seek Challenges in the World

- Invite a math or science teacher or someone who has chosen to be an engineer to your meeting. Ask this person what it takes to get into different types of engineering fields. Also find out what kind of classes you need to take in order to further your education in the right direction.
- Try some string art. Be sure your creation has definite geometric patterns. You could frame your finished project and give it to someone as a gift, or keep it yourself and find an appropriate place to hang it.

Girls Develop Critical Thinking

- Numbers are very important to all engineers. Nothing can be created without knowing how to make numbers work! Do some math games. Check out this website: www.coolmath.com for some fun!
- Enclosed in this packet is a matching game. This will familiarize you with the different jobs or creations for each type of engineer. The answers are included, but try guessing first!
- Discuss the different types of engineers. Which ones do you think are the most exciting and interesting? Are there girls in your group who are serious about finding out more about being an engineer? How can the rest of the group support her?
- Discuss with your group what type of machinery uses gears. What can you create using a gear system?
- How would you build a house on the moon? What would it need for you to survive and to live comfortably?

CONNECT ACTIVITIES



Girls Promote Cooperation and Team Building

- Enclosed in this packet is a word search game. It will familiarize you with the names of most of the different types of engineers. See if you can work together and find them all!
- Play a game of charades. Act out a type of engineer by showing what they might create. The girl who guesses the right answer does the next charade. Play until everyone who wants to gets a chance to participate.
- Make a list of items in your own bedroom or Girl Scout meeting area created by an engineer. Decide which type of engineer created each item on your list. Discuss your list with the other girls in your group.
- Create different structures using toothpicks and mini marshmallows. How tall can you build your structure? Can you build a bridge? What shape makes the strongest structure?

Girls Feel Connected to Their Communities

- Visit the National Engineers Week Internet site at <http://www.eweek.org> to learn about engineers' contributions to our quality of life. Share this information with others.
- Women engineers are very special people. There are not a lot. Check out this awesome website to learn about some of them: www.engineergirl.org. Or go to your local library and find books on the subject. Share what you find out with the rest of your group.
- Read *Girls Think of Everything: Stories of Ingenious Inventions by Women* written by Catherine Thimmesh. Do you have an invention lurking somewhere inside of you? Share your thoughts and ideas with others.

TAKE ACTION ACTIVITY (Complete the activity below, or design your own!)

Girls Educate and Inspire Others to Act

- If you could be any type of engineer what would you like your greatest accomplishment to be? Use your imagination to envision what might be your most important contribution to society. Pick one way to show others what that might be and how it would benefit society:
 - *Draw a picture.
 - *Write a story.
 - *Make a sample of how it might look and explain its purpose.
 - *Put on a skit. Ask some of the others in your group to help you.

Match the Engineer



Match the invention to the engineer who you think is responsible. Answers are on the next page. Remember, there is usually more than one right answer! If you find you have differences of opinion, discuss it. You're probably all correct! Make copies of this page for girls to play in small groups of two or three or discuss together as a whole group.

Invention

Traffic lights
Bridges
Fireproof suit
Vaccines and other medicines
3-way light bulb
Radio controlled medical carts
Space stations
Visual telephones
Electric cars
Seedless watermelon
No-line bifocal eyeglasses
Fax machines

Types of Engineers

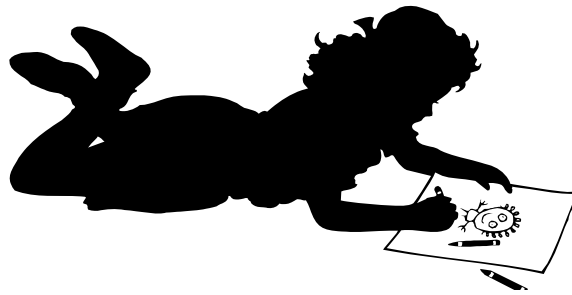
Aerospace
Environmental
Agricultural
Mechanical
Civil
Chemical
Medical
Communication
Transportation
Electrical



Word Search

LZTIGUBQSIRIPPRTB OITBIP
 AEROSPACECOMDGLSVKURHCT
 RHIPLACI RTCELELELDYTJOW
 UGHYRDPYGEHDIPLMAURYPMI
 TKOLVKNCHEMICALHCPLDZML
 LOEJLPYLHRUCDBUIIPYRLUP
 UPGNBT PCKILATNEMNORIVNE
 CIVILZOTJRBLHOGJAZECOIC
 IBONPYTEFASJOLSCHRTDVCO
 RLDDCGNPHILNPZIUCPUEBAP
 GOTUZUROKLRIEJKPEOPHKT B
 AZUSROHRNIOLVIDTMBMLSIU
 RTPTRANSPORTATIONIONYOK
 QRIRHTSJOIPKROBOTICSLNT
 WOSIUPBONILEQOGPKZNBTOG
 BPDAYMIEJORITULTROCUVBP
 TZQLPOLIQTSORPAOZIPBCEJ

AEROSPACE
 AGRICULTURAL
 CHEMICAL
 CIVIL
 COMMUNICATION
 COMPUTER
 ELECTRICAL
 ENVIRONMENTAL
 INDUSTRIAL
 MECHANICAL
 MEDICAL
 ROBOTICS
 SAFETY
 TRANSPORTATION



Answers to the Match Game:

Traffic lights – Mechanical, Transportation
 Bridges – Civil, Environmental
 Fireproof suit – Chemical
 Vaccines – Medical, Chemical
 3-way light bulb – Electrical, Mechanical, Environmental
 Radio-controlled medical carts – Mechanical, Transportation, Medical,
 Communication
 Space station – Aerospace, Environmental, Communication, Mechanical,
 Transportation
 Visual telephone – Communication, Mechanical, Electrical
 Electric cars – Environmental, Mechanical, Transportation
 Seedless watermelons – Agricultural
 No-line bifocal eyeglasses – Medical
 Fax machines – Communication, Mechanical, Electrical

Answers to Word Search

L Z T I G U B Q S I R I P P R T B O I T B I P
 A E R O S P A C E C O M D G L S V K U R H C T
 R H I P L A C I R T C E L E L E L D Y T J O W
 U G H Y R D P Y G E H D I P L M A U R Y P M I
 T K O L V K N C H E M I C A L H C P L D Z M L
 L O E J L P Y L H R U C D B U I I P Y R L U P
 U P G N B T P C K I L A T N E M N O R I V N E
 C I V I L Z O T J R B L H O G J A Z E C O I C
 I B O N P Y T E F A S J O L S C H R T D V C O
 R L D D C G N P H I L N P Z I U C P U E B A P
 G O T U Z U R O K L R I E J K P E O P H K T B
 A Z U S R O H R N I O L V I D T M B M L S I U
 R T P T R A N S P O R T A T I O N I O N Y O K
 Q R I R H T S J O I P K R O B O T I C S L N T
 W O S I U P B O N I L E Q O G P K Z N B T O G
 B P D A Y M I E J O R I T U L T R O C U V B P
 T Z Q L P O L I Q T S O R P A O Z I P B C E J

Building Possibilities

EVALUATION

(Please return this evaluation with your patch order.)

Leader's Name: _____ Group #: _____

Grade Level: Da. ___ Br. ___ Jr. ___ Cd. ___ Sr. ___ Am. ___

What were the girls' favorite activities?

# of Girls	Activity
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What were the girls' least favorite activities?

# of Girls	Activity
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Did this program help the girls think about career possibilities for their future?

Are there any other comments the girls would like to share with us?

Building Possibilities Patch Order

Leader's Name: _____ Group #: _____

Age Level: Da. ___ Br. ___ Jr. ___ Cd. ___ Sr. ___ Am. ___

Street Address: _____

City: _____ State: _____ Zip: _____

Day Phone #: _____ Evening Phone #: _____

of Patches wanted: _____ x \$1.50 = _____
Shipping and handling (see below) + _____
Total = _____

Please send this form and a check payable to GSGWM to:
Girl Scouts of the Green and White Mountains
PO Box 10832
Bedford, NH 03110-0832

~OR~

VISA and MasterCard are also accepted.

Please charge my: VISA MasterCard

Signature: _____
(A signature is required on all credit card orders.)

Account #: _____

Expiration Date: __ / __

Shipping and Handling Rates

Under 18.99	\$4.50	\$75-\$99.99	\$10.00
\$19-\$29.99	5.75	\$100-\$149.99	12.50
\$30-\$44.99	7.50	\$150-\$199.99	13.75
\$45-\$59.99	8.00	\$200-\$249.99	18.50
\$60-\$74.99	9.50	Over \$250.00	23.00

If you have any questions, call 603-627-4158 or 1-888-474-9686