



KIDS SAFETY PROGRAM

Created by the Common Ground Alliance |

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UNDERGROUND UTILITY SAFETY

This curriculum was developed by the Common Ground Alliance to educate children across America!

Learning Objectives

After completing this station, participants should be able to:

- Recognize and identify the markings for underground utilities.
- Define/explain various types of underground utilities and their purposes.
- Explain how and why to “Call Before You Dig.”
- State three reasons for avoiding damage to underground utilities: be safe, be legal, and be a good neighbor by not disrupting important services such as gas, water, electric, phone, cable, etc.
- Outline steps to take if they disturb or find a disturbed underground utility.
- Tell parents to “Call Before You Dig.” The call and the locator services are free.

Safety Requirements

- Instructors displaying samples of cables should make sure no sharp wires are exposed.
- Instructors using the tarp for the “Locator Motivator” activity should make sure loose tarp edges don’t create a tripping hazard.
- For the “Locator Motivator” activity, instructors should make sure participants are physically able to handle a locator instrument.
- Instructors using the “Down and Dirty Obstacle Relay” should check for holes, loose rocks, etc., that might cause participants to stumble and fall.

Age-Appropriateness

This lesson is appropriate for participants of all ages, and especially between the ages of 8 and 13. All children should be taught never to play near underground utility excavation work and to avoid damaging underground utilities by digging or removing marker flags and warning signs. Children ages 10 and older should also be taught how to recognize and report underground utility damage.

The message for all participants is to be safe, be legal, and be a good neighbor by not disturbing or damaging underground utilities, and to tell their parents to “Call Before You Dig.” The depth of content and discussion needs to be tailored to the level of understanding of the group.

Suggested Instructors

Any presenter can use the information provided in this lesson to teach an interesting session on underground utility awareness and safety. However, involving presenters with expertise in the area of designing, installing, locating and repairing underground utilities adds depth and variety. These people include: representatives from the utility companies such as natural gas, electricity, telephone and cable television, employees of locator services, city or county planners, contractors and excavators, representatives from your local One-Call Center and public works representatives. In many areas you can reach the One-Call Center by calling 811.

Before presenting this program presenters should learn their One-Call toll free phone number and whether the nation-wide 811 phone number has been implemented in their area. Presenters should also know and understand basic information about their One-Call Center and any laws that govern underground utilities (hours of operation, how far in advance you need to call, fines, etc.).

Hands-On Activities/Demonstrations

The activities are designed to reinforce the information taught about underground utilities using verbal, visual, and hands-on learning opportunities.

Choose from the activities below based on the age of your group, the site you have available, and the resource people you have recruited. Base your discussion points on the activity as part of your presentation. Keep in mind that a minimum understanding and a few points are probably enough information for children. A full description of each of the below begins on page 8.

Program Descriptions

1. B4UGoB-lo Rap Contest – To reinforce information about the One-Call system, participants learn a rap about calling before you “go below,” and volunteers “perform” the rap for the group. Then, in groups of 2 or 3, participants create their own raps about underground utility awareness and

perform their raps for the group. The starter rap is “No slice is right/So now you know/To call eight-one one/Before you ‘go below.’” This activity is better for ages 9 to 12.

2. Banana Object Lesson – A common banana illustrates how a cable or pipe protects the utility running through it. In this activity, the banana represents the cable or pipe and a piece of spaghetti represents the utility running through it. This fun activity can be reproduced at home to help parents understand the need to call before they dig.

3. Down and Dirty Obstacle Relay – In this team relay, participants maneuver through an obstacle course marked by utility warning colors, using a plastic sand shovel to carry sand from the start line to fill a bucket at the finish line, avoiding decoy flags that don’t relate to underground utilities. The activity reinforces the concept of the warning flag system as well as makes a point that, while hand-held tools usually don’t damage lines and cables, you should always call before you dig. Ages 8 to 12 would enjoy this relay.

4. Locator Motivator Team Activity – This is a team activity involving a search for “underground” utilities using a locator instrument. After instruction in underground utility awareness and safety and an explanation of how a locator works, a representative from each team tries to locate utilities “buried” beneath a ground covering such as a tarp. Participants learn that lines and cables can be buried almost anywhere in their community. Participants must be physically developed enough to handle a locator. An inexpensive metal detector may also be used.

5. “Call Before You Dig” Game Show – Using a Hollywood Squares format, participants on two teams hear scenarios involving calling before you dig and decide whether the “Hollywood star” responds to the situation correctly. The fun is in how convincing the “star” is, whether he or she is right or wrong, and how discriminating the teams are. The moderator gives the correct explanation for each scenario. This game is best for participants ages 10 and older because it involves higher level reasoning skills.

Subject Outline

This subject outline contains information that can be presented and then reinforced by choosing one of the hands-on activities. This is only “suggested” content as there is much that can be said about underground utility awareness and safety. Presenters can provide first-hand experiences on this topic. In addition, illustrations, brochures, posters, and websites listed in the resource section can provide much more information, if needed.

Introduction/Capture Their Attention

- Introduce yourself and tell about your role working with underground utilities (if any).
- Find out about your audience. Ask questions: Have any of you seen an underground cable or pipeline? Do you know what the pipeline was for?
- Discuss terminology needed to understand the lesson.
- Tell the participants that it is very important that they share what they learn with their parents, other members of their family and friends.

Discussion Points

- Define and explain the importance of underground utilities.
 - List utilities and tell what each does, provides, transports, etc.
 - Show samples of pipes and cables and explain that they are buried at varying depths.
 - Show and explain the flag marking system and warning signs using actual flags/posts or visuals.

Discuss the color code system:

- Red – Electric power lines, cables, conduit and lighting cables
 - Orange – Communications, i.e. phone, alarm, cables, conduit, traffic loops
 - Yellow – Gas, oil, fiber optics, steam, petroleum, gaseous materials
 - Green – Sewer and drain lines
 - Blue – Potable (drinking) water
 - Purple – Reclaimed water, irrigation and slurry lines
 - Pink – Temporary survey markings
 - White – Proposed excavation
- Explain reasons utilities are marked:
 - So they can be repaired.
 - So professional excavators can avoid damaging existing lines.
 - Look for markers in the area and point them out to the participants.
 - Explain the importance of not moving or tampering with flags and markers.
 - Give three rules for underground utility awareness and safety.
 - Be Safe
 - Discuss the dangers associated with damaging the following underground utilities: Electric – danger of injury and power being shut off to houses in the area, including yours.

- Discuss the dangers associated with damaging the following underground utilities: Gas (natural gas, ammonia, etc.) and liquid (gasoline, propane, crude oil, etc.).
- Danger of explosions and fires.
- How to detect gas and liquid leaks (illustration available).
- What to do in the case of a gas or liquid leak: get away and tell an adult.
- Discuss the dangers associated with damaging the following underground utilities: Communication, telephone or fiber optics, (including the utilities that carry calls to the 911 center) – could be interrupted, leaving people without a way to get help when they need it.
- Remind participants to never play in or near excavation sites or on equipment.
- Explain that interrupted service can pose a threat to health or life for those dependent on the service. Examples: A person dependent on an electrically powered medical device or an elderly person dependent on a natural gas-fueled heating system during a very cold winter.
- Explain the One-Call Center: It's free, fast, easy, and the law. In many areas it's available all the time, day or night. [Instructors: Confirm the hours of operation for your area's One-Call Center.]
- Be Legal (It's the law, "Call Before You Dig.")
 - Explain the laws for your area about calling the One-Call Center before digging. Point out that utility companies will come out and mark the existing utility lines for free.
 - Remind them that we all want to be good citizens and obey the law.
- Be a Good Neighbor
 - Talk about the inconvenience and safety problems of interrupted service such as 911, gas, electric, etc.
 - Discuss the possible cost of repairs and loss of service.
 - Talk about what to do if you or someone in your family plans to dig or if you see someone digging who hasn't called the One-Call Center.
 - Explain what to do if you see that utility marker flags or warning posts have been disturbed.
 - Tell them how important it is to keep the environment safe.

Resources

All illustrations can be found at www.call811.com.

Some resources may be obtained from participating utility companies or the local One-Call Center.

- Flag Markers – Actual flag markers available from utility companies or illustrations found on the website.
- Warning Signs – Actual warning signs and posts available from utility companies or illustrations found on the website.
- Natural Gas System - Illustrations showing a typical natural gas system found on the website.
- “Cut-Away” examples – Illustrations of underground utilities going into a home or farm found on the website.
- Signs of a Pipeline Leak – Illustration listing signs of a pipeline leak found on the website.
- Rap Song – Illustration of the words to the B4UGoB-Lo Rap song found on the website.
- Safety Rules – Illustration of the Underground Utility Safety Rules found on the website.
- Various Illustrations – All available on the website.
- One-Call Centers – Many One-Call Centers, utility companies, contractors, city or county planners and locator services may have information to share such as: Coloring books, posters, brochures, and low-cost or no-cost items such as pens, flashlights, caps, stickers, etc. Call at least 3 months before your event to inquire about these items and give them time to acquire a quantity for low cost or in some cases no charge.
- Locator – A locator is a piece of equipment that locates buried utilities.
- Contact your local utility company representatives for the name of locator services that might bring and demonstrate the use of a locator instrument.
- Large Tarp – A nursery, contractor, building supply store, carpet business or funeral home may loan a ground cover such as a large tarp for the “Locator Motivator” hands-on activity.
- Web sites – The following web sites are also resources for information on underground utilities and damage prevention. The list is not all inclusive and should only be used as a general reference.
 - www.commongroundalliance.com - Common Ground Alliance is the sponsor for this curriculum. The website contains many links.
 - www.call811.com – The source for all information regarding the nationwide 811 campaign.
 - www.digsafely.com - Color posters to print, brochures and a Kids presentation.
 - www.pipeline101.com – General pipeline information

- www.ubsinfo.com/one_call.shtml - One-Call Center directory and list of laws for each state.
- www.underspace.com – Sponsored by the “Underground Focus” magazine and includes purchase information for a coloring book called Digger and Trigger. Click on Damage Prevention Media.
- www.northernnaturalgas.com/html/publiceducation.asp - Overview of natural gas.
- www.westarenergy.com – Select About Us then select Kids Corner.
- www.rockymtnpower.net – Click on Safety. Contains “Electricity 101” program information and activities on electricity.
- www.safeelectricity.org – Click on Teachers Materials for games and teaching materials.
- www.eon-us.com/kids/ - “Kids Connection” learn about natural gas and electric principles and safety including games, teaching materials, links, and other resources.
- www.hicahs.colostate.edu/childrencorner/childrenwebsite – has
- “Children’s Corner” games and information on rural safety.
- www.pge.com - Pacific Gas and Electric Company website, select For My Home, then select Education and Safety for a website that contains information and games for kids.
- www.wisconsinpublicservice.com/safetyforkids/landing.html - The site is designed for kids and explores Electrical and Natural Gas Safety Worlds.

B4UGOB-LO RAP CONTEST

Learning Objective

After completing this activity, participants should be able to:

- Recognize and identify the markings of underground utilities.
- Explain how and why to “Call Before You Dig.”
- State three reasons for avoiding damage to underground utility lines: Be safe, be legal, and be a good neighbor.
- Outline steps to take if they disturb or find a disturbed underground utility line.

Safety Requirements

Instructors displaying samples of cables should make sure no sharp wires are exposed.

Age-Appropriateness

This lesson is appropriate for participants ages 9 and older. While 9 and 10-year olds may have more trouble creating a rap, they will enjoy performing one. The presenter should cover the discussion points of underground utility awareness and safety, and then use this activity to reinforce them.

The depth of content and discussion needs to be tailored to the level of understanding of the group.

Suggested Instructors

Any presenter can use the information provided in this lesson to teach an interesting session on underground utility awareness and safety. However, involving presenters with expertise in the area of designing, installing, locating and repairing underground utilities adds depth and variety. These people include: representatives from the utility companies such as natural gas, electricity, telephone and cable television, employees of locator services, city or county planners, contractors and excavators, representatives from your local One-Call Center and public works representatives. In many areas you can reach the One-Call Center by calling 811.

Local One-Call Centers can help coordinate with local utilities and may be able to help find an instructor.

If a presenter from a particular utility is recruited, coordinators should encourage them to include information on all the utilities represented in the lesson in order to have a balanced presentation of underground utility awareness.

Before presenting this program presenters should learn their One-Call toll free phone number and whether the nation-wide 811 phone number has been implemented in their area. Presenters should also know and understand basic information about their One-Call Center and any laws that govern underground utilities (hours of operation, how far in advance you need to call, fines, etc.).

Equipment/Supplies Needed

- See Resource section on page 6.

Subject Outline

- Introduction/Capture Their Attention
 - Introduce yourself and tell about your experience with underground utilities.
 - Find out about your audience. Ask questions: Ask whether they personally know anyone - a friend or family member - who is a good rapper (try to avoid getting into naming professional rappers because of the problem of inappropriate lyrics). Raps are fun because they have rhyme, have catchy wording, have a good beat and usually tell a story.
 - Explain that participants will have the opportunity to be a rap star.
 - Discuss terminology needed to understand the lesson.
 - Tell the participants that it is very important that they share what they learn with their parents, other members of their family and friends.

Activity/Demonstration

- Teach everyone the first rap (see starter lyrics on available illustration). Let volunteers come to the front and perform it. The more they ham it up, the better.
- Divide the participants into groups of 2 or 3 and have them create their own rap related to calling before you dig. Distribute paper and pencils to those who need it. Circulate to make sure raps use appropriate words and are on the assigned topic, and to offer suggestions if a team has writer's block.
- Let each team come to the front of the group and perform their rap.
- If you have extra time, let a team who created a really catchy rap teach it to the entire group.

Discussion Points

- Define and explain the importance of underground utilities.
 - List utilities and tell what each does, provides, transports, etc.
 - Show samples of pipes and cables and explain that they are buried at varying depths.

- Show and explain the flag marking system and warning signs using actual flags/posts or visuals.
Discuss the color code system:
 - Red – Electric power lines, cables, conduit and lighting cables
 - Orange – Communications, i.e. phone, alarm, cables, conduit, traffic loops
 - Yellow – Gas, oil, fiber optics, steam, petroleum, gaseous materials
 - Green – Sewer and drain lines
 - Blue – Potable (drinking) water
 - Purple – Reclaimed water, irrigation and slurry lines
 - Pink – Temporary survey markings
 - White – Proposed excavation
- Explain reasons utilities are marked:
 - So they can be repaired.
 - So professional excavators can avoid damaging existing lines.
- Look for markers in the area and point them out to the participants.
- Explain the importance of not moving or tampering with flags and markers.
- Give three rules for underground utility awareness and safety.
 - Be Safe
 - Discuss the dangers associated with damaging the following underground utilities: Electric – danger of injury and power being shut off to houses in the area, including yours.
 - Discuss the dangers associated with damaging the following underground utilities: Gas (natural gas, ammonia, etc.) and liquid (gasoline, propane, crude oil, etc.).
 - Danger of explosions and fires.
 - How to detect gas and liquid leaks (illustration available).
 - What to do in the case of a gas or liquid leak: Get away and tell an adult.
 - Discuss the dangers associated with damaging the following underground utilities: Communication, telephone or fiber optics, (including the utilities that carry calls to the 911 center) – could be interrupted, leaving people without a way to get help when they need it.
 - Remind participants to never play in or near excavation sites or on equipment.
 - Explain that interrupted service can pose a threat to health or life for those dependent on the service. Examples: A person dependent on an electrically powered medical device or an elderly person dependent on a natural gas-fueled heating system during a very cold winter.

- Explain the One-Call Center: It's free, fast, easy, and the law. In many areas it's available all the time, day or night. [Instructors: Confirm the hours of operation for your area's One-Call Center.]
- Be Legal (It's the law, "Call Before You Dig.")
 - Explain the laws for your area about calling the One-Call Center before digging. Point out that utility companies will come out and mark the existing utility lines for free.
 - Remind them that we all want to be good citizens and obey the law.
- Be a Good Neighbor
 - Talk about the inconvenience and safety problems of interrupted service such as 911, gas, electric, etc.
 - Discuss the possible cost of repairs and loss of service.
 - Talk about what to do if you or someone in your family plans to dig or if you see someone digging who hasn't called the One-Call Center.
 - Explain what to do if you see that utility marker flags or warning posts have been disturbed.
 - Tell them how important it is to keep the environment safe.

Resources

- See Resource section on page 6.

Supplies

- One-Call Centers and utility companies should be able to provide you with most of the equipment and supplies that you need for this activity.

BANANA OBJECT LESSON

Learning Objective

After completing this activity, participants should be able to:

- Explain how underground cables and pipes protect utility lines.
- Tell how to avoid damaging underground utilities by avoiding digging near them.

Safety Requirements

Instructors displaying samples of cables should make sure no sharp wires are exposed.

Age-Appropriateness

This lesson is appropriate for participants ages 8 and older. The presenter should cover the discussion points of underground utility awareness and safety, and then use this activity to reinforce them.

The depth of content and discussion needs to be tailored to the level of understanding of the group.

Suggested Instructors

Any presenter can use the information provided in this lesson to teach an interesting session on underground utility awareness and safety. However, involving presenters with expertise in the area of designing, installing, locating and repairing underground utilities adds depth and variety. These people include: representatives from the utility companies such as natural gas, electricity, telephone and cable television, employees of locator services, city or county planners, contractors and excavators, representatives from your local One-Call Center and public works representatives. In many areas you can reach the One-Call Center by calling 811.

Local One-Call Centers can help coordinate with local utilities and may be able to help find an instructor.

If a presenter from a particular utility is recruited, coordinators should encourage them to include information on all the utilities represented in the lesson in order to have a balanced presentation of underground utility awareness.

Before presenting this program presenters should learn their One-Call toll free phone number and whether the nation-wide 811 phone number has been implemented in their area. Presenters should also know and understand basic information about their One-Call Center and any laws that govern underground utilities (hours of operation, how far in advance you need to call, fines, etc.).

Equipment/Supplies Needed

- An unripe banana, with ends cut off.
- Pieces of dry thick spaghetti.
- A plastic spoon and a plastic knife.
- See Resource section on page 6.

Subject Outline

- Introduction/Capture Their Attention
 - Introduce yourself and tell about your experience with underground utilities.
 - Find out about your audience. Ask questions: How many of you have seen pipes in the ground? Do you know what they were for?
 - Discuss terminology needed to understand the lesson.
 - Tell the participants that it is very important that they share what they learn with their parents, other members of their family and friends.

Activity/Demonstration

- Explain to the participants what underground utilities are.
- Show the banana and ask, “How is a banana like an underground cable or pipe”?
- With the participants watching, insert a piece or two of spaghetti through the banana. This takes a little practice because spaghetti noodles are straight and bananas are curved. Explain that the spaghetti represents the underground utilities and the banana represents the cable or pipeline that it is in. (If you prefer, don’t use the spaghetti and say that the banana peel represents the pipe and the banana is the utility inside the pipe.)
- Explain that the banana peel is water resistant. Like the sheathing on the cable or the casing on the pipe, it keeps water out.
- Like the pipeline protects the product inside, the banana peel also cushions and protects the spaghetti (or banana flesh).
- Have a volunteer come to the front of the group and “dig” on the banana with the plastic spoon. The banana may dent, but stay intact.
- Tell the group that the plastic spoon represents a small hand tool or trowel. Like the plastic spoon didn’t damage the banana, a small hand tool or trowel usually would not damage a cable or pipe. However, it is always safest to call before you dig. (If by chance the spoon breaks the spaghetti, use that as an example of why you should always call before you dig.)

- Have a second volunteer “dig” on the banana with a plastic knife. The knife will most likely cut through peel, banana flesh and spaghetti.
- Tell the group that the knife represents a hole digger, pick ax, or piece of digging machinery. Like the plastic knife a hole digger, pick ax, or a piece of digging machinery can cut the underground utilities.
- Ask how the banana could help participants remember the way to avoid damaging underground utilities. Challenge them to go home and do this activity with their parents to encourage them to always call the One-Call Center before they dig.
- Note: an easy take-home reinforcement for this object lesson is to send a banana home with each participant. If time permits, have them write “Call 811 B4UDig” on it with a permanent marker.

Discussion Points

- Define and explain the importance of underground utilities.
 - List utilities and tell what each does, provides, transports, etc.
 - Show samples of pipes and cables and explain that they are buried at varying depths.
 - Show and explain the flag marking system and warning signs using actual flags/posts or visuals.
Discuss the color code system:
 - Red – Electric power lines, cables, conduit and lighting cables
 - Orange – Communications, i.e. phone, alarm, cables, conduit, traffic loops
 - Yellow – Gas, oil, fiber optics, steam, petroleum, gaseous materials
 - Green – Sewer and drain lines
 - Blue – Potable (drinking) water
 - Purple – Reclaimed water, irrigation and slurry lines
 - Pink – Temporary survey markings
 - White – Proposed excavation
 - Explain reasons utilities are marked:
 - So they can be repaired.
 - So professional excavators can avoid damaging existing lines.
 - Look for markers in the area and point them out to the participants.
 - Explain the importance of not moving or tampering with flags and markers.
- Give three rules for underground utility awareness and safety.
 - Be Safe

- Discuss the dangers associated with damaging the following underground utilities: Electric – danger of injury and power being shut off to houses in the area, including yours.
- Discuss the dangers associated with damaging the following underground utilities: Gas (natural gas, ammonia, etc.) and liquid (gasoline, propane, crude oil, etc.).
 - Danger of explosions and fires.
 - How to detect gas and liquid leaks (illustration available).
 - What to do in the case of a gas or liquid leak: get away and tell an adult.
- Discuss the dangers associated with damaging the following underground utilities: Communication, telephone or fiber optics, (including the utilities that carry calls to the 911 center) – could be interrupted, leaving people without a way to get help when they need it.
- Remind participants to never play in or near excavation sites or on equipment.
- Explain that interrupted service can pose a threat to health or life for those dependent on the service. Examples: A person dependent on an electrically powered medical device or an elderly person dependent on a natural gas-fueled heating system during a very cold winter.
- Explain the One-Call Center: It's free, fast, easy, and the law. In many areas it's available all the time, day or night. [Instructors: Confirm the hours of operation for your area's One-Call Center.]
- Be Legal (It's the law, "Call Before You Dig.")
 - Explain the laws for your area about calling the One-Call Center before digging. Point out that utility companies will come out and mark the existing utility lines for free.
 - Remind them that we all want to be good citizens and obey the law.
- Be a Good Neighbor
 - Talk about the inconvenience and safety problems of interrupted service such as 911, gas, electric, etc.
 - Discuss the possible cost of repairs and loss of service.
 - Talk about what to do if you or someone in your family plans to dig or if you see someone digging who hasn't called the One-Call Center.
 - Explain what to do if you see that utility marker flags or warning posts have been disturbed.
 - Tell them how important it is to keep the environment safe.

Resources

- See Resource section on page 6.

Supplies

- One-Call Centers and utility companies should be able to provide you with most of the equipment and supplies that you need for this activity.

DOWN AND DIRTY OBSTACLE COURSE RELAY

Learning Objective

After completing this activity, participants should be able to:

- Recognize and identify the markings for underground utilities.
- Define/explain various types of underground utilities and their purposes.
- Explain how and why to “Call Before You Dig.”
- State three reasons for avoiding damage to underground utility lines: Be safe, be legal, and be a good neighbor by not disrupting important services such as 911, gas, water, electric, phone, cable, etc.
- Outline steps to take if they disturb or find a disturbed underground utility line.
- Tell parents to “Call Before You Dig.” The call and the locator services are free.

Safety Requirements

- Instructors displaying samples of cables should make sure no sharp wires are exposed.
- Instructors should check for holes, loose rocks, etc., that might cause participants to stumble and fall.

Age-Appropriateness

This activity is appropriate for ages 8 and older. It is good for mixed aged groups, as long as the teams are evenly divided along age, size, and athletic ability factors. If you have an odd number, let a volunteer be referee, scorekeeper or cheerleader. The presenter should cover the discussion points of underground utility awareness and safety, and then use this activity to reinforce them.

The depth of content and discussion needs to be tailored to the level of understanding of the group.

Suggested Instructors

Any presenter can use the information provided in this lesson to teach an interesting session on underground utility awareness and safety. However, involving presenters with expertise in the area of designing, installing, locating and repairing underground utilities adds depth and variety. These people include: Representatives from the utility companies such as natural gas, electricity, telephone and cable television, employees of locator services, city or county planners, contractors and excavators, representatives from your local One-Call Center and public works representatives. In many areas you can reach the One-Call Center by calling 811.

Local One-Call Centers can help coordinate with local utilities and may be able to help find an instructor. If a presenter from a particular utility is recruited, coordinators should encourage them to include information on all the utilities represented in the lesson in order to have a balanced presentation of underground utility awareness.

Before presenting this program presenters should learn their One-Call toll free phone number and whether the nation-wide 811 phone number has been implemented in their area. Presenters should also know and understand basic information about their One-Call Center and any laws that govern underground utilities (hours of operation, how far in advance you need to call, fines, etc.).

Equipment/Supplies Needed

- Relay area about 18 X 50 feet. Set up two courses, each with a slightly different arrangement of the colored flags (fabric).
- 6 X 6 in. pieces of fabric representing the flag markers: orange, yellow, blue, green, red, purple, white, plus 2 or 3 decoy flags such as brown, black and gray. These are placed on the ground in a line between the start line and the finish line of each course at about 5-foot intervals. You can substitute the corresponding fabric colors and spray paint circles in place of the fabric flags if allowed.
- Four plastic buckets.
- Two plastic sand shovels.
- Several buckets or a pile of sand.
- See Resource section on page 6.

Subject Outline

- Introduction/Capture Their Attention
 - Introduce yourself and tell about your role working with underground utilities.
 - Find out about your audience. Ask questions: Ask who has seen the brightly colored flags along a roadway or at a building site. Who knows what they are for?
 - Explain that the flags are like a code and participants will learn to understand the code.
 - Discuss terminology needed to understand the lesson.
 - Tell the participants that it is very important that they share what they learn with their parents, members of their family and friends.

Activity/Demonstration

- Set up two relay courses. On each, mark off a start line and a finish line about 50 feet apart. In a line between them, place the fabric flags at about 5-foot intervals. Include the “decoy” flags randomly. If allowed, you could substitute paint circles using the corresponding paint colors.
- Place the bucket of sand and two plastic shovels at the start line. Place an empty bucket at the finish line.
- Divide the group into two teams as evenly matched as possible for size and athletic ability. Each team lines up one behind the other at the start line. An odd number person or anyone who can't walk can be the score keeper/referee.
- Explain that the object of the relay is to move the sand from the bucket at the start line to the one at the finish line, using only the shovel provided. Each team member fills the shovel, proceeds toward the finish line, completely circling each utility marker flag. If a flag isn't a real marker color, skip it. When he has emptied his shovel of sand into the bucket, he walks straight back to the start line and passes the shovel to the next team member in line. The first team to fill their bucket (or get it the fullest in a given time limit) wins.
- To add interest, you can give special instructions about how to circumnavigate certain colored flags. For example, at every white flag the relay walker may have to hop on one foot around it or circle it twice.

Discussion Points

- Define and explain the importance of underground utilities.
 - List utilities and tell what each does, provides, transports, etc.
 - Show samples of pipes and cables and explain that they are buried at varying depths.
 - Show and explain the flag marking system and warning signs using actual flags/posts or visuals.

Discuss the color code system:

- Red – Electric power lines, cables, conduit and lighting cables
- Orange – Communications, i.e. phone, alarm, cables, conduit, traffic loops
- Yellow – Gas, oil, fiber optics, steam, petroleum, gaseous materials
- Green – Sewer and drain lines
- Blue – Potable (drinking) water
- Purple – Reclaimed water, irrigation and slurry lines
- Pink – Temporary survey markings
- White – Proposed excavation

- Explain reasons utilities are marked:
 - So they can be repaired.
 - So professional excavators can avoid damaging existing lines.
- Look for markers in the area and point them out to the participants.
- Explain the importance of not moving or tampering with flags and markers.
- Give three rules for underground utility awareness and safety.
 - Be Safe
 - Discuss the dangers associated with damaging the following underground utilities: Electric – danger of injury and power being shut off to houses in the area, including yours.
 - Discuss the dangers associated with damaging the following underground utilities: Gas (natural gas, ammonia, etc.) and liquid (gasoline, propane, crude oil, etc.).
 - Danger of explosions and fires.
 - How to detect gas and liquid leaks (illustration available).
 - What to do in the case of a gas or liquid leak: get away and tell an adult.
 - Discuss the dangers associated with damaging the following underground utilities: Communication, telephone or fiber optics, (including the utilities that carry calls to the 911 center) – could be interrupted, leaving people without a way to get help when they need it.
 - Remind participants to never play in or near excavation sites or on equipment.
 - Explain that interrupted service can pose a threat to health or life for those dependent on the service. Examples: A person dependent on an electrically powered medical device or an elderly person dependent on a natural gas-fueled heating system during a very cold winter.
 - Explain the One-Call Center: it's free, fast, easy, and the law. In many areas it's available all the time, day or night. [Instructors: Confirm the hours of operation for your area's One-Call Center.]
 - Be Legal (It's the law, "Call Before You Dig.")
 - Explain the laws for your area about calling the One-Call Center before digging. Point out that utility companies will come out and mark the existing utility lines for free.
 - Remind them that we all want to be good citizens and obey the law.
 - Be a Good Neighbor
 - Talk about the inconvenience and safety problems of interrupted service such as 911, gas, electric, etc.
 - Discuss the possible cost of repairs and loss of service.

- Talk about what to do if you or someone in your family plans to dig or if you see someone digging who hasn't called the One-Call Center.
- Explain what to do if you see that utility marker flags or warning posts have been disturbed.
- Tell them how important it is to keep the environment safe.

Resources

- See Resource section on page 6.

Supplies

- One-Call Centers and utility companies should be able to provide you with most of the equipment and supplies that you need for this activity.

LOCATOR MOTIVATOR

Learning Objective

After completing this activity, participants should be able to:

- Recognize and identify the markings for underground utilities.
- Define/explain various types of underground utilities and their purposes.
- Explain how and why to “Call Before You Dig.”
- State three reasons for avoiding damage to underground utility lines: Be safe, be legal, and be a good neighbor by not disrupting important services such as 911, gas, water, electric, phone, cable, etc.
- Outline steps to take if they disturb or find a disturbed underground utility line.
- Tell parents to “Call Before You Dig.” The call and the locator services are free.

Safety Requirements

- Instructors displaying samples of cables should make sure no sharp wires are exposed.
- If using a tarp, instructors should make sure loose tarp edges don’t create a tripping hazard.
- Instructors should make sure participants are physically able to handle a locator instrument.

Age-Appropriateness

This team activity is appropriate for ages 10 and older because of the need to be able to physically handle a locator instrument. The presenter should cover the main points of underground utility awareness and safety, and then use this activity to reinforce the flag code and the importance of calling before you dig.

The depth of content and discussion needs to be tailored to the level of understanding of the group.

Suggested Instructors

Any presenter can use the information provided in this lesson to teach an interesting session on underground utility awareness and safety. However, involving presenters with expertise in the area of designing, installing, locating and repairing underground utilities adds depth and variety. These people include: representatives from the utility companies such as natural gas, electricity, telephone and cable television, employees of locator services, city or county planners, contractors and excavators, representatives from your local One-Call Center and public works representatives. In many areas you can reach the One-Call Center by calling 811.

Local One-Call Centers can help coordinate with local utilities and may be able to help find an instructor. If a presenter from a particular utility is recruited, coordinators should encourage them to include information on all the utilities represented in the lesson in order to have a balanced presentation of underground utility awareness.

Before presenting this program presenters should learn their One-Call toll free phone number and whether the nation-wide 811 phone number has been implemented in their area. Presenters should also know and understand basic information about their One-Call Center and any laws that govern underground utilities (hours of operation, how far in advance you need to call, fines, etc.).

Equipment/Supplies Needed

- A locator instrument used by utilities and locator services to find underground pipelines and cables. An inexpensive metal detector may substitute. [Be sure to have extra batteries.]
- Large opaque (not see-through) ground covering at least 18 X 30 ft. such as plastic tarp, artificial grass, or indoor/outdoor carpet.
- Various wires and cables to “bury” under the ground covering. [Before the event, test to make sure the locator can actually find the items.]
- Coded flag markers to set into the ground at the entry point of each “utility”.
- See also Resource section page 6.

Subject Outline

- Introduction/Capture Their Attention
 - Introduce yourself and tell about your role working with underground utilities.
 - Find out about your audience. Ask questions: Who likes a treasure hunt? Who has ever used a metal detector and what did you find?
 - Discuss terminology needed to understand the lesson.
 - Tell the participants that it is very important that they share what they learn with their parents, other members of their family and friends.

Activity/Demonstration

- Show the locator instrument and explain that you’ll show how to use it to find a buried treasure – such as an underground utility.
- Divide the group into teams with 4-5 participants on each team.

- Let each team have a turn with the locator finding and following a given utility line (beginning at the marker flag for each).
- Remind participants that:
 - We can't see underground utilities so we don't always know where they are.
 - We don't know how deep they are buried so never dig near buried utilities.
 - Sometimes the approximate location of the utility is marked with paint, flags or warning signs.
 - Before you or your parents dig anywhere, call the One-Call Center to get help locating buried pipes and cables. The call and location service are free and are performed by a trained professional.

Discussion Points

- Define and explain the importance of underground utilities.
 - List utilities and tell what each does, provides, transports, etc.
 - Show samples of pipes and cables and explain that they are buried at varying depths.
 - Show and explain the flag marking system and warning signs using actual flags/posts or visuals.
Discuss the color code system:
 - Red – Electric power lines, cables, conduit and lighting cables
 - Orange – Communications, i.e. phone, alarm, cables, conduit, traffic loops
 - Yellow – Gas, oil, fiber optics, steam, petroleum, gaseous materials
 - Green – Sewer and drain lines
 - Blue – Potable (drinking) water
 - Purple – Reclaimed water, irrigation and slurry lines
 - Pink – Temporary survey markings
 - White – Proposed excavation
 - Explain reasons utilities are marked:
 - So they can be repaired.
 - So professional excavators can avoid damaging existing lines.
 - Look for markers in the area and point them out to the participants.
 - Explain the importance of not moving or tampering with flags and markers.
- Give three rules for underground utility awareness and safety.
 - Be Safe

- Discuss the dangers associated with damaging the following underground utilities: Electric – danger of injury and power being shut off to houses in the area, including yours.
- Discuss the dangers associated with damaging the following underground utilities: Gas (natural gas, ammonia, etc.) and liquid (gasoline, propane, crude oil, etc.).
 - Danger of explosions and fires.
 - How to detect gas and liquid leaks (illustration available).
 - What to do in the case of a gas or liquid leak: get away and tell an adult.
- Discuss the dangers associated with damaging the following underground utilities: Communication, telephone or fiber optics, (including the utilities that carry calls to the 911 center) – could be interrupted, leaving people without a way to get help when they need it.
- Remind participants to never play in or near excavation sites or on equipment.
- Explain that interrupted service can pose a threat to health or life for those dependent on the service. Examples: A person dependent on an electrically powered medical device or an elderly person dependent on a natural gas-fueled heating system during a very cold winter.
- Explain the One-Call Center: It's free, fast, easy, and the law. In many areas it's available all the time, day or night. [Instructors: Confirm the hours of operation for your area's One-Call Center.]
- Be Legal (It's the law, "Call Before You Dig.")
 - Explain the laws for your area about calling the One-Call Center before digging. Point out that utility companies will come out and mark the existing utility lines for free.
 - Remind them that we all want to be good citizens and obey the law.
- Be a Good Neighbor
 - Talk about the inconvenience and safety problems of interrupted service such as 911, gas, electric, etc.
 - Discuss the possible cost of repairs and loss of service.
 - Talk about what to do if you or someone in your family plans to dig or if you see someone digging who hasn't called the One-Call Center.
 - Explain what to do if you see that utility marker flags or warning posts have been disturbed.
 - Tell them how important it is to keep the environment safe.

Resources

- See Resource section on page 6.

Supplies

- One-Call Centers and utility companies should be able to provide you with most of the equipment and supplies that you need for this activity.

“CALL BEFORE YOU DIG” GAME SHOW

Learning Objective

After completing this activity, participants should be able to:

- Recognize and identify the markings for underground utilities.
- Define/explain various types of underground utilities and their purposes.
- Explain how and why to “Call Before You Dig.”
- State three reasons for avoiding damage to underground utility lines: be safe, be legal, and be a good neighbor by not disrupting important services such as 911, gas, water, electric, phone, cable, etc.
- Outline steps to take if they disturb or find a disturbed underground utility line.
- Tell parents to “Call Before You Dig.” The call and the locator services are free.

Safety Requirements

Instructors displaying samples of cables should make sure no sharp wires are exposed.

Age-Appropriateness

This team activity is appropriate for ages 10 and older because it involves higher level reasoning skills.

The presenter should cover the main points of underground utility awareness and safety, and then use this activity to reinforce the flag code and the importance of calling before you dig.

The depth of content and discussion needs to be tailored to the level of understanding of the group.

Suggested Instructors

Any presenter can use the information provided in this lesson to teach an interesting session on underground utility awareness and safety. However, involving presenters with expertise in the area of designing, installing, locating and repairing underground utilities adds depth and variety. These people include: representatives from the utility companies such as natural gas, electricity, telephone and cable television, employees of locator services, city or county planners, contractors and excavators, representatives from your local One-Call Center and public works representatives. In many areas you can reach the One-Call Center by calling 811.

Local One-Call Centers can help coordinate with local utilities and may be able to help find an instructor. If a presenter from a particular utility is recruited, coordinators should encourage them to include information on all the utilities represented in the lesson in order to have a balanced presentation of underground utilities awareness.

Before presenting this program presenters should learn their One-Call toll free phone number and whether the nation-wide 811 phone number has been implemented in their area. Presenters should also know and understand some basic information about their One-Call Center and any laws that govern underground utilities (hours of operation, how far in advance you need to call, fines, etc.).

Equipment/Supplies Needed

- You will need two adult or older youth volunteers to be “Hollywood stars”.
- These volunteers need to be lively, out-going and theatrical. They need to be someone who can fib with a straight face. Because of this, you may want to use the same two volunteers each time you lead this session.
- Set of game show situations/questions (at the end of this section).
- Paper, dry erase board, poster or flip chart and marker to record score on.
- See Resource section on page 6.

Subject Outline

- Introduction/Capture Their Attention
 - Introduce yourself and tell about your experience with underground utilities.
 - Find out about your audience. Ask questions: How many of you like to watch game shows on TV? What are some of the game shows you and your parents like? What’s fun about watching game shows? [Hopefully they will mention trying to guess the answers to the questions.]
 - Discuss terminology needed to understand the lesson.
 - Explain that in this lesson, participants will get to be in a game show.
 - Tell the participants that it is very important that they share what they learn with their parents, other members of their family and friends.

Activity/Demonstration

- Divide the group into two teams. The teams don’t have to be equally divided, so an easy way is to draw an imaginary line down the middle of the group to separate them into Team 1 and Team 2. Let the teams select a name for themselves. A volunteer could be score keeper.

- Introduce the “Hollywood stars.” Each star is assigned a team. Explain that the stars will be given a situation involving digging near underground utilities. The star will give a response. The opposing team confers and then agrees or disagrees with the response and tells why. A point is given if the team is right, regarding the star’s answer (which may or may not have been right).
- The fun comes when the star tries to throw the opposing team off with outlandish but convincing responses. For example, the situation might be, “Your cousin wants to have a digging contest to see who can dig the deepest hole in the vacant lot next door. Does this present any problem for underground utilities?” The star might answer, “It’s o.k. to have the contest, but to avoid the possibility of cutting a cable or pipe, make it a contest to see who can dig to 18-inches first. That way you won’t dig deep enough to damage an underground utility.” If the opposing team says,
- “Correct,” they lose the point. If they say, “Incorrect” and explain that some cables and pipes might be closer to the surface so you should call before you dig, they would get the point. The team with the most points at the end of a set time wins.
- Read the situations/questions (found at the end of this unit) and let the teams respond. Ask someone to keep score on the dry erase board, poster or flip chart.
- At the end of the session, review the following points.
 - We can’t see underground utilities so we don’t always know where they are.
 - We don’t know how deep they are buried so never dig near buried utilities.
 - Sometimes they are marked with flags or warning posts. Never disturb, move or take the flags or other markings.
 - Before you or your parents dig anywhere, call 811 to get help locating buried pipes and cables. The call and location service are free.
 - Show illustrations: Remember to B Safe, B Legal, and B A Good Neighbor: Call B4UDig.

Discussion Points

- Define and explain the importance of underground utilities.
 - List utilities and tell what each does, provides, transports, etc.
 - Show samples of pipes and cables and explain that they are buried at varying depths.
 - Show and explain the flag marking system and warning signs using actual flags/posts or visuals. Discuss the color code system:
 - Red – Electric power lines, cables, conduit and lighting cables
 - Orange – Communications, i.e. phone, alarm, cables, conduit, traffic loops

- Yellow – Gas, oil, fiber optics, steam, petroleum, gaseous materials
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- Explain reasons utilities are marked:
 - So they can be repaired.
 - So professional excavators can avoid damaging existing lines.
- Look for markers in the area and point them out to the participants.
- Explain the importance of not moving or tampering with flags and markers.
- Give three rules for underground utility awareness and safety.
 - Be Safe
 - Discuss the dangers associated with damaging the following underground utilities: Electric – danger of injury and power being shut off to houses in the area, including yours.
 - Discuss the dangers associated with damaging the following underground utilities: Gas (natural gas, ammonia, etc.) and liquid (gasoline, propane, crude oil, etc.).
 - Danger of explosions and fires.
 - How to detect gas and liquid leaks (illustration available).
 - What to do in the case of a gas or liquid leak: get away and tell an adult.
 - Discuss the dangers associated with damaging the following underground utilities: Communication, telephone or fiber optics, (including the utilities that carry calls to the 911 center) – could be interrupted, leaving people without a way to get help when they need it.
 - Remind participants to never play in or near excavation sites or on equipment.
 - Explain that interrupted service can pose a threat to health or life for those dependent on the service. Examples: A person dependent on an electrically powered medical device or an elderly person dependent on a natural gas-fueled heating system during a very cold winter.
 - Explain the One-Call Center: It’s free, fast, easy, and the law. In many areas it’s available all the time, day or night. [Instructors: Confirm the hours of operation for your area’s One-Call Center.]
 - Be Legal (It’s the law, “Call Before You Dig.”)

- Explain the laws for your area about calling the One-Call Center before digging. Point out that utility companies will come out and mark the existing utility lines for free.
- Remind them that we all want to be good citizens and obey the law.
- Be a Good Neighbor
 - Talk about the inconvenience and safety problems of interrupted service such as 911, gas, electric, etc.
 - Discuss the possible cost of repairs and loss of service.
 - Talk about what to do if you or someone in your family plans to dig or if you see someone digging who hasn't called the One-Call Center.
 - Explain what to do if you see that utility marker flags or warning posts have been disturbed.
 - Tell them how important it is to keep the environment safe.

Resources

- See Resource section on page 6.

Supplies

- One-Call Centers and utility companies should be able to provide you with most of the equipment and supplies that you need for this activity.

GAME SHOW SITUATIONS/QUESTIONS

1. Utility workers are digging trenches and installing big pipe near your house. There are deep holes, huge piles of dirt, sand and gravel, and some cool earth-moving equipment on the site. Your friends suggest you go play there after the workmen have left for the day. Should you follow your friend's suggestion?

Correct answer: NO – Play it safe – never play in or around excavation sites.

2. You want to surprise your mom and plant geraniums around the base of the mailbox. Do you call before you dig?

Correct answer: As long as you use a garden hand tool or trowel, it's o.k. to plant small flowers. If you plan to dig deeper using a shovel or pick, call the One-Call Center to have the utility companies mark the underground utilities.

3. Your dad is planning to put up a fence in front of your house to make a pasture for the new horse. Should he call the One-Call Center before he digs?

Correct answer: YES – He should call the One-Call Center to make sure no utilities are buried along the proposed fence line.

4. Polly the Poodle has died. You and your family plan a funeral with burial in the back yard by the fence. Should you call the One-Call Center before you dig?

Correct answer: YES – Call before you dig!

5. Your family plans to install an above-ground swimming pool but it looks like you'll have to do a good bit of dirt leveling, using a small back hoe and shovels. Should you call the One-Call Center?

Correct answer: YES – Underground utilities may be buried in the back yard, so call the One-Call Center to have utility companies come out and mark the underground utilities before you begin digging for the pool.

6. You were walking home from the bus stop with some friends and saw a row of brightly colored flags – red, yellow, orange, blue, and white. A couple of your friends pulled up some flags, walked along playing with them, then stuck them into the ground in a different place. What should you do?

Correct answer: In the first place, never disturb the flags that mark underground utilities. But don't try to replace them if they have been moved. Have your parents call the One-Call Center to report that the flags have been disturbed.

7. Your family is having a barbeque and your dad plans to use a back hoe to dig a barbeque pit. Should he call the One-Call Center before he digs?

Correct answer: YES – Call the One-Call Center before you dig.

8. Your neighbor is installing an irrigation system in his front yard. This afternoon, you smelled an odor like rotten eggs. What should you do?

Correct answer: Get away and tell an adult. Ask the adult to call 911. If no adult is available, call the sheriff, police, or 911 and describe where you are and what you see.

9. While digging a hole to plant your mother's dogwood tree, you feel the digging tool strike something. You look in the bottom of the hole and see a cable. You start to cover the hole back up and dig a hole somewhere else. Are you doing the right thing?

Correct answer: You should have called the One-Call Center to begin with, but since the tool struck the cable, the cable could already be damaged. Call the One-Call Center to report the exposed cable and possible damage.

10. Your club received a grant to purchase trees to plant and beautify your school campus. You are on the planting committee to decide how and where to plant the trees. What should you do next?

Correct answer: Call the One-Call Center to get them to send utility representatives to locate all underground utilities and agree with school officials on the best place to plant trees after you know where the utilities are located.

11. You decide to build a fort near a pipeline right of way in the pasture behind your house. What should you do next?

Correct answer: Call the One-Call Center to have them send a utility representative to mark the pipelines so you will know where they are located. You will not be able to dig near the pipelines.

12. Your club has received a grant to build a nature trail in the wooded area near your school. What should you do?

Correct answer: Unless you plan to dig, grade or move dirt, you shouldn't have to call the One-Call Center since the nature trail would only involve surface clearing and trail making.

13. Your grandfather has hired you and your cousins to dig up and remove some large rocks in his front yard near the driveway. What's the first thing you should do?

Correct answer: Your grandfather should call the One-Call Center before anyone digs under or pries up the rocks, since underground utilities could be buried only a few inches deep or under the rocks.

14. You've offered to help your neighbor put up a fantastic playground set for his toddler. Among other things, you'll be digging holes to set the braces in cement. You also plan to dig out a space to put a sandbox in. What should happen next?

Correct answer: Your neighbor should call the One-Call Center before you start the project.

15. You are helping a friend and his dad break up the concrete slab to an old building in their side yard. What's next?

Correct answer: The dad should call the One-Call Center to make sure there are no underground utilities under the slab.

16. For his 75th birthday, your family is surprising your grandfather with a flagpole in the front yard. You plan to dig a hole and pour cement to support the 17-foot high pole. What should you do first?

Correct answer: Call the One-Call Center before you dig the hole.

17. While fishing, you see a line of continuous bubbles rising in a pond that was recently drained and refilled. What should you do?

Correct answer: Get away and have an adult call 911, since this can be a sign of a leak.