

Scoop Accident, First Aid Problem

Instructor's Copy

Behavioral Research Aspects of Safety and
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¹ This exercise was developed and field tested under U. S. Bureau of Mines research Contract No. H0348040. Information about the design and characteristics of the exercise and the field test results are available in the project technical reports filed with the Bureau of Mines Research Center in Pittsburgh, PA. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies or recommendations of the Interior Department's Bureau of Mines or the U. S. Government.

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Introduction

This document contains most of the materials needed to use the exercise. The main part of the document is the instructor's copy. It tells how to use the exercise, presents the objectives, the master answer sheet, the scoring key, and discussion notes to be used following the exercise. The next section is three appendices. Appendix A is the exercise problem booklet. This booklet can be duplicated locally. The booklets are reusable. One is needed for every person in the classroom. Appendix B is the answer sheet. Copies of this answer sheet must have the invisible ink answers that appear in Appendix C printed on them². Answer sheets are consumable. One is needed for each group of 3 to 5 persons who work the exercise.

Exercise Summary

Read this section first. It determines if the exercise is appropriate for your classes. If you choose to use the exercise, examine the table of contents and review the remainder of this document.

Type: Invisible ink

Length: 16 questions (45 minutes for administration plus 30 for discussion)

Skills: Proper procedures for using a scoop as a mantrip
Recognizing unsafe work practices and procedures
First aid
Conducting a primary and secondary survey
Determining priority of first aid treatment procedures
Treating arterial bleeding associated with an open fracture
Properly splinting, dressing, and immobilizing fractures
Properly immobilizing and transporting a victim with multiple fractures

Location: Underground

Problem: After 9 months of unemployment, Joe has recently completed the required training to reenter the mines and has just completed an advanced first aid course. He has been hired as an experienced roof bolter at a drift mine. This is his first day on the job. A scoop loaded with supplies pulls up and six other miners start climbing on top of it. Two miners get into the bucket next to the supplies. Joe is instructed to ride on top of the scoop. The mine roof is low and the roadway is rough. He is worried about his and the other miners' safety. Soon there is an accident and a miner is seriously injured. No one takes charge. Joe must decide what to do.

² You can do this yourself if you have the proper equipment, or you may obtain copies of preprinted answer sheets from NIOSH, Pittsburgh Research Laboratory, Pittsburgh, PA phone 412-386-5901, fax 412-386-5902 or email to minetraining@cdc.gov.

How To Use This Exercise

1. Look at the performance objectives. Decide if the exercise is relevant for your mine training class.
2. Work through the exercise with the developing pen and score your responses.
3. Read the master answer sheet for the exercise. Look at all the answers.
4. Read the "Instructor's Discussion Notes" for the exercise.
5. Become thoroughly familiar with the problem so that you can present it to your class without reading it. Put the illustrations on an overhead projector so you can use these to help explain the problem.
6. When you present the exercise to the class:
 - Give each person an exercise booklet, and each small group of 3 to 5 persons an answer sheet, and a developing pen.
 - Demonstrate how to select and mark answers using the developing pen.
 - Go over the instructions for doing the exercise with the whole group.
 - Explain the problem making sure everyone understands the problem situation.
 - Have the class members work the exercise.
 - When the class members finish, have them figure up their score using the instructions at the end of the exercise.
 - When everyone has finished, discuss the exercise. Let class members discuss the merits of each answer. Add your own ideas.

Performance Objectives for Scoop Accident, First Aid Problem Exercise

Objective number	Capability verb(s)	Description of required performance and conditions under which it is to occur
1. PH ³	Recognize	Potential hazards of riding on top of a piece of mobile haulage equipment not designed for personnel transport
2. PH	Recall Select	Proper methods and procedures for using a scoop as a mantrip
3. SWP	Recognize Identify	Work practices and procedures that create hazardous conditions for miners
4. SWP	Recognize Determine	When it is appropriate to refuse work when the work order places the miner in a dangerous situation
5. SWP	Anticipate Evaluate	The consequences of complying with or not complying with an unsafe work order
6. FA	Recall Recognize Determine	The necessity of taking charge in a first aid emergency situation when one has the appropriate skills and the victim needs help
7. FA	Recall Select	Steps, order, and procedures for conducting an assessment of injuries to an accident victim
8. FA	Recall Select	Procedures for immobilization and stabilization prior to moving and transporting an accident victim
9. FA	Recognize Identify	Measures for the control of arterial bleeding associated with an open fracture
10. FA	Recall Recognize	Proper procedures for bandaging and splinting open fractures of the lower legs
11. FA	Recognize Select	Proper methods for transporting and monitoring a seriously injured victim from a mine in order to minimize further injury

³ Skill and knowledge domain abbreviations:

PH = powered haulage

FA = first aid

SWP = safe work practices

Master Answer Sheet for Scoop Accident, First Aid Problem

Use this answer sheet to mark your selections. Rub the developing pen gently and smoothly between the brackets. Don't scrub the pen or the message may blur. Be sure to color in the entire message once you make a selection. Otherwise you may not get the information you need.

Question A (Select as MANY as you think are correct.)

- 1. [This is not a good idea.]
- 2. [Correct! But the foreman tells Joe that the crew says it rides too rough and
[that they prefer the scoop. He tells Joe to get on.]
- 3. [One of the miners yells, "Who are you calling stupid!" Joe has angered his
[new co-workers and the foreman.]
- 4. [Correct! But, the foreman says, "You're not task trained to run it. Get on the
[scoop!"]
- 5. [Correct! But, the foreman says the other scoops are already inside. He tells
[Joe to climb on.]

Question B (Choose only ONE unless you are told to "Try Again!")

- 6. [This is dangerous. Overhead clearance is tight. Try again!]
- 7. [This is dangerous. Men are in the bucket. Try again!
[]
[]
- 8. [The scoop operator is not a qualified electrician. Try again!
[]
- 9. [Correct! Getting the mantrip is the best action, but the foreman tells the
[miners to shine their lamps inby and the scoop operator to continue on. Do
[the next question.]
- 10. [The light is insufficient for safe operation. Try again!]

Question C (Choose only ONE unless you are told to "Try Again!")

- 11. [Correct! But the foreman tells Joe this is not where he'll be working and to get back on the scoop if he wants to keep his job. Do the next question.]
- 12. [Even though Joe is able to get lower now, he should not ride with loose materials in the bucket. Try again!]
- 13. [Joe is at risk while being transported in such overcrowded conditions on top of equipment in low coal. Try again!]
- 14. [Another brush against the top could split Joe's skull. Try again!]

Question D (Choose only ONE unless you are told to "Try Again!")

- 15. [The foreman gets mad. He says, "Get off my back!" Try again!]
- 16. [Correct! Paul needs Joe's care immediately. Do the next question.]
- 17. [The foreman ignores Joe and keeps telling Paul not to die. Try again!]
- 18. [Joe should not do this at this time. Try again!]
- 19. [Joe waits for half a minute or so, but no one takes charge. Try again!]

Question E (Select as MANY as you think are correct.)

- 20. [Correct! One brings the first aid kit while the other calls outside on the pager and then returns with the stretcher.]
- 21. [Correct!]
- 22. [This could cause further injury to Paul.]
- 23. [This could cause further injury to Paul.]
- 24. [This scoop's lights don't work. It shouldn't be used to transport Paul.]
- 25. [Correct! It's a good idea to have a miner get a scoop ready for Paul.]

Question F (Select as MANY as you think are correct.)

- 26. [If he has a spinal injury, this action may hurt Paul.]
- 27. [Correct! Joe opens Paul's airway without moving his neck.]
- 28. [Joe does this. Paul doesn't respond.]
- 29. [Correct! Joe sees Paul's chest rise and fall, and he feels air move when he
[puts his cheek near Paul's mouth.]
- 30. [There is something else Joe should do at this time.]
- 31. [Another miner says, "Don't do that! You'll hurt him!"]
- 32. [Correct! His pulse is fast.]
- 33. [Joe is wasting time. Paul may die.]
[]

Question G (Select as MANY as you think are correct.)

- 34. [Correct! Clothing should be removed from injured areas so the extent of
[injuries can be determined.]
- 35. [This could cause further injury.]
- 36. [This could cause further injury.]
- 37. [Correct!]
- 38. [This won't help. Joe needs to reassure Paul, not scare him.]

Question H (Choose only ONE unless you are told to "Try Again!")

- 39. [A tourniquet is a last resort measure. Try again!]
- 40. [This could cause Paul's death. Try again!]
- 41. [Correct! Do the next question.]
- 42. [This could cause Paul's death. Try again!]
- 43. [This could cause Paul's death. Try again!]

Question I (Select as MANY as you think are correct.)

- 44. [Paul may die if Joe does this.]
- 45. [Correct! This is needed to keep the bleeding stopped.]
- 46. [This could cause further injury.]
- 47. [Correct! Paul's legs need to be splinted before moving him.]

Question J (Select as MANY as you think are correct.)

- 48. [Correct!]
- 49. [Correct!]
- 50. [Correct!]
- 51. [If this happens, Joe is being too rough. Don't do this!]
- 52. [Absolutely not! Only qualified medical personnel should set fractures.]
- 53. [Correct!]

Question K (Choose only ONE unless directed to "Try again!")

- 54. [This wastes time and causes unnecessary movement that could hurt Paul.]
[Try again!]
- 55. [This might hurt Paul or kill him. Try again!]
- 56. [Correct! Paul should be treated as if he had a neck fracture. Do the next]
[question.]
- 57. [This might hurt Paul or kill him. Try again!]

Question L (Select as MANY as you think are correct.)

- 58. [This is not the correct way to secure Paul to the stretcher.]
- 59. [Vomiting is a concern, but this is not the way to secure Paul to the stretcher.]
- 60. [Correct! Paul may have a neck fracture.]
- 61. [Correct! This will help treat his shock.]

Question M (Select as MANY as you think are correct.)

- 62. [This is too slow and difficult. The coal is only 54 inches high. It is too far.]
- 63. [Correct! This will make Paul's ride smoother and prevent further injury.]
- 64. [This could hurt Paul. The roadway is rough. The scoop should be trammed]
[carefully and at a moderate speed.]
- 65. [Correct! This will help Paul's circulation and help treat his shock.]
- 66. [Correct! Paul's condition could worsen. He might vomit.]
- 67. [Correct! But just look. Don't move the dressings or peak under them.]
- 68. [Correct! Even if Paul is unresponsive, reassurance can help him.]

Question N (Select as MANY as you think are correct.)

- 69. [This did not contribute to the accident.]
- 70. [This type of maintenance should be done, but only by a qualified electrician.]
- 71. [Correct! It is dangerous to ride on top of equipment and prohibited by law.]
- 72. [Correct! Other materials in the bucket can injure miners during travel.]
- 73. [Correct! Miners have the right to refuse unsafe work orders.]
- 74. [This is impractical and unnecessary.]

Question O (Write out your answers.)

75. I would _____

76. I would do this because

77. As a result of my actions what might or might not happen?

Question P List all violations you can find in this problem.

Finding your score for Questions A through N

Number of "Correct" answers you colored in = (1)_____

42 min number of incorrect answers you colored in = (2)_____

Add the values in blanks one and two to get your total score = (3)_____

Highest possible score = 74

Lowest possible score = 0

Instructor's Discussion Notes for Scoop Accident, First Aid Problem

Use the information presented here and on the master answer sheet, your own ideas and experience, and that of the miners in your class to discuss the exercise after it is completed. Group discussion can strengthen knowledge and skills, correct errors, and relate the exercise content to the experiences of the miners. After they have worked the exercise, miners enjoy discussing the problem. They also frequently think of better ways to respond to a problem than those listed among the answers. The purpose of the exercise is to help miners think about and remember basic knowledge and skills they may someday need to deal with a mine emergency. The discussion following the exercise can contribute to this goal and tailor the exercise content to the needs of the group you are training.

It is helpful to show overhead transparencies of the answers on the master answer sheet during the discussion, while the miners look at their problem booklets. This allows you to lead the group through the exercise and to discuss all the answers to each question. Most of the information about why particular answers are correct or incorrect is given on the master answer sheet.

The following notes provide additional information for you to discuss with your class. Read through and think about the notes before the class. Incorporate the ideas you find here with your own ideas and make these points at the appropriate place in the discussion of the exercise.

Question A - The correct answers are 2, 4, and 5. A potential hazard exists when miners ride equipment not designed for personnel transport. Here, a decision must be made as to whether to "go along with the crowd" (1) or to challenge the others' decision to place themselves at risk. Answer 3, although a challenge, is not likely to be effective, since it will antagonize the crew. This question may promote discussion about how to effectively discourage co-workers from taking safety risks. Those in your class who have been experienced miners returning to work after a layoff, or who can recall just beginning at another mine can be asked to contribute their ideas and experiences to the discussion.

Question B - The correct answer is 9. Even if it were being properly used for personnel transport, the scoop should have been taken out of service when the lights went out (30 CFR 75.175 (a)). (Note: Some states prohibit the use of coal haulers for the transport of miners.) This close to the outside it would be better to find alternate transportation than to take time to fix the scoop's lights right then. All other actions increase the hazard potential for the miners riding on or in the scoop.

Question C - The correct answer is 11. Here again there is a conflict between doing the right (and safe) thing and yielding to pressure to compromise safety. Ultimately, each miner must judge for him or herself when a work order or practice is hazardous and should be refused. Miners have the right to refuse unsafe work orders. Answers 12 and 13 also place the new miner in danger. Answer 13 is especially dangerous, since he is unfamiliar with the haul route and with its areas of limited height restrictions and associated overhead obstructions, such as headers, crossbars, overcasts, etc. At least

in the bucket, the miner can stay lower than those riding on top of the scoop. However, the supplies in the bucket make this dangerous and it too is a violation of 30 CFR 75.1403-7(k). Answer 14 is illegal (30 CFR 75.1720(d)), and clearly unwise. This could easily lead to a fatal head or neck injury. All of the miners on the scoop are at risk because of overcrowded conditions (30 CFR 1403-7(b)).

Question D - The correct answer is 16. The foreman and other miners are not organizing and beginning first aid treatment for Paul. The new miner should take charge. If no one takes charge, Paul could suffer further injury or death.

Question E - The correct answers are 20, 21, and 25. As the most capable first aider on the scene, the new miner must both direct others and provide care for Paul. The helpers may be best employed by sending them to obtain first aid supplies, communicate to the surface, and get transportation ready for Paul. The new miner needs to complete a survey of Paul's injuries and needs. Because Paul may have sustained spinal or other immediate life threatening injuries, moving him now will at best delay proper care, and at worst may lead to permanent injury or death. Using the scoop with no lights would be hazardous. There is time for another miner to get another scoop while Joe takes care of Paul and gets him ready for transport.

Question F - The correct answers are 27, 29, and 32. The first priorities are to determine if Paul is having airway, breathing, or circulation problems and to treat these as they are found. This is done by checking for consciousness by pinching Paul's shoulder and shouting to him. If the victim does not respond, the airway should be opened. When there are possible head and spinal injuries, the airway is opened by grasping the victim's lower jaw on both sides with your finger tips, and moving the jaw forward without moving the head. At this point the absence or presence of breathing is determined. If breathing is absent, rescue breathing is begun. Finally, the neck pulse is checked to determine the quality of circulation. In the absence of a pulse, cardiac compressions may be started if the first aider is trained to do CPR.

Question G - The correct answers are 34 and 37. Since Paul has passed the primary survey (he is breathing and he has circulation), the head to toe secondary survey should be carried out to determine the extent of injuries and treatment priorities. Because Paul has been run over by a scoop, the first aider should keep in mind the possibility of spinal or other severe injuries. The victim should be handled and checked accordingly. Areas of significant bleeding should be identified, exposed, and examined carefully, so that bleeding can be promptly and correctly controlled. Whenever possible, the first aider should communicate to the victim about what is being done and attempt to convey the idea that competent help is available and that all necessary measures are being implemented. This reassurance can help victims survive serious injuries.

Question H - The correct answer is 41. Bright red, spurting blood indicates that an artery has been lacerated or severed. This arterial bleeding must be treated immediately to prevent life threatening blood loss. At this point, direct pressure with the hand at the site of the bleeding is the best course of action. Looking for a suitable dressing can waste time. The direct pressure on the wound may be supplemented by pressure at the femoral artery pressure point in the groin, if another person is able to

assist. A loose dressing at the site of the wound will not stop the bleeding. It is vitally important that the victim not be rushed outside without receiving appropriate in-mine first-aid. There have been many cases where miners have died because the decision was made to rush them outside to a hospital or waiting ambulance before controlling bleeding and stabilizing the victim.

Question I - The correct answers are 45 and 47. Paul is lying in a puddle with two lower leg fractures and an arterial bleed which is being controlled by direct pressure. Paul needs to be transported quickly so that intravenous fluids may be administered to correct his low blood volume. However, though time is critical, the first aiders in the mine must take time to stop Paul's bleeding and splint his leg fractures. First aid priorities require that these things be done before Paul is moved, even though the cold water in the puddle is chilling him.

Question J - The correct answers are 48, 49, 50, and 53. At the first aider level of care, fractured limbs should be straightened only enough to apply a splint. A pulse should be taken at a point the other side of the injury in relationship to the heart, both before and after the splint is secured, to make sure blood flow has not been cut off. Proper splinting will result in: a) pain reduction, b) easier victim movement and transport, c) reduction of nerve, muscle, and blood vessel damage, d) decreased skin laceration by broken bones, e) maintenance of blood flow to the limb beyond the injury site, and f) decreased overall blood loss.

Question K - The correct answer is 56. While Paul's fractured legs are the most obvious injury, the circumstances of his accident suggests that a neck or other spinal fracture may be present. Paul may also have broken ribs or other internal injuries. Although log rolling with head support is the proper method of moving a possible spine injured victim who is not on his back, the procedure is not appropriate in this case. Once he was rolled into the scoop bucket, Paul would still have to be lifted onto the stretcher to be properly immobilized. It is better to lift Paul once in a proper manner than to roll him or drag him into the scoop only to have to lift him a second time before his immobilization. All the other actions listed would endanger Paul.

Question L - The correct answers are 60 and 61. Clearly Paul needs to be transported to the surface quickly so that intravenous fluids may be administered to correct his low blood volume and treat his shock. However, the first aiders must take time to immobilize Paul on the stretcher and to cover him with a blanket to prevent further heat loss. Without these first aid measures, Paul may not survive the trip to the portal or his shock may become irreversible by the time he gets to the ambulance. While his vomiting is a concern, his head must still be immobilized. If he begins to vomit once he is fully immobilized on the stretcher, the whole stretcher can be tilted to the side while raising the foot end. This position, and finger sweeps of his mouth, will keep his airway open and prevent aspiration of his vomit fluids into his lungs.

Question M - The correct answers are 63, 65, 66, 67, and 68. The first aider should remember that rough handling and transport can undo his earlier life saving efforts. Paul's condition can change at any moment. His basic functions must be constantly monitored on the way out (airway, breathing, circulation). Finally, the pain of a severe

injury is often as much in the mind of the victim as it is in the body. A first aider who communicates with and reassures the victim, as well as demonstrates good care, can temper the pain and reduce its long term effects. This can sometimes mean the difference between life and death for the victim.

Question N - The correct answers are 71, 72 and 73. It is the responsibility of the operator of mobile mining equipment to check to see that his or her vehicle is in safe working order. The operator should not open control panels or tamper with devices or controls for which he is not suitably trained. (For a list of safe work practices for trackless coal operations, see Underground coal haulage and transportation, pp. 145-146.) In this problem, factors other than those listed in answers 72, 73, and 74 contributed to the accident. You might ask class members to identify some of these. A few others include: a) excessive speed of the scoop (30 CFR 75.1403-7(f)), b) rough and rutted bottom conditions (30CFR 75.1403-10(i)), overcrowding (30 CFR 75.1403-7 (b)), and transporting extraneous materials and supplies on equipment (30 CFR 75.1403-7 (o)).

Question O - There is no simple answer to any of these three questions. Miners, like other persons, usually know what is safe and not safe. It is sometimes easy to know what the safe and proper procedures are and yet not follow these. One has only to look at the driving, pedestrian, boating, hunting, etc. behavior of even the most careful and safety conscious individuals, especially our own behavior. The purpose of this question is to have miners and supervisors think about how they might respond in a similar situation. The opportunity to discuss such matters in the classroom may make it easier for miners to challenge the occasional unsafe work practice exhibited by themselves, co-workers, or supervisors.

Question P - Many of the violations have been noted in the discussion notes to previous questions. Can you identify others?

References

- Blankenship, R. L. (1985). Report of investigation (underground coal mine): Fatal powered haulage accident. Mine ID No. 44-03763, Buchanan Co., WV.: MSHA, Coal Mine Health & Safety, District 6.
- Gilbert, G. G. (1981). Teaching first aid and emergency care. Dubuque, IA: Kendal/Hunt.
- Lineberry, G. T. (1985). Mine haulage and transportation, In F. Cameron (Ed.). The Kentucky underground coal mine guidebook (pp. 54-71). Lexington, KY: The Kentucky Mining Institute.
- Mine Safety and Health Administration. (1980). First aid book. Washington, D.C.: U.S. Government Printing Office.
- Mine Safety and Health Administration. (1983). Underground coal haulage and transportation (pp. 123-146). Washington, D.C.: U.S. Government Printing Office.
- Office of the Federal Register. (July 1986). Code of federal regulations. Washington, D.C.: U.S. Government Printing Office.

Scoring Key for Scoop Accident, First Aid Problem

The correct answers are marked with an asterisk.⁴

Question	Answer Number								
A	1	2*	3	4*	5*				
B	6	7	8	9*	10				
C	11*	12	13	14					
D	15	16*	17	18	19				
E	20*	21*	22	23	24	25*			
F	26	27*	28	29*	30	31	32*	33	
G	34*	35	36	37*	38				
H	39	40	41*	42	43				
I	44	45*	46	47*					
J	48*	49*	50*	51	52	53*			
K	54	55	56*	57					
L	58	59	60*	61					
M	62	63*	64	65*	66*	67*	68*		
N	69	70	71*	72*	73*	74			

⁴ This page may be copied and used as an overhead transparency.

Appendix A: Problem Booklet

Duplicate this copy of the problem booklet for use in your classes. **Booklets should be printed on only one side of the paper.** Each person in your class should have a problem booklet while they are working the exercise. The problem booklets are reusable.

You may obtain a copy of the problem booklet from NIOSH, Pittsburgh Research Laboratory, Pittsburgh, PA phone 412-386-5901, fax 412-386-5902 or email to minetraining@cdc.gov.

Scoop Accident, First Aid Problem

Problem Booklet

Instructions

Read the problem situation described on the next page. Study the diagram until you understand the location of the miners and equipment in the problem. Next, answer each of the 16 questions. Do them one at a time. Don't jump ahead, but you may look back to earlier questions and answers. Some of the questions ask you to choose only one answer unless you are directed to "Try again!" Other questions ask you to select as many answers as you think are correct. Follow the directions for each question.

After you have selected a choice to a question, look up its number on the answer sheet. Select your answer to each question by rubbing the special pen between the brackets on the answer sheet. A hidden message will appear and tell you if you are right. When you have finished, you will learn how to score your performance.

Scoop Accident, First Aid Problem Exercise

Background

Joe is a newly hired, experienced roof bolter at a two-section drift mine.

This is his first day on the job at this mine.

After 9 months of unemployment, Joe has recently completed the required training to reenter the mines.

He has also just completed an advanced first-aid course.

It is 7:00 a.m. and Joe is waiting with six others to go underground.

The seam height is 4 1/2 feet.

Problem

Joe is getting to know the crew that he will be working with as they wait for a ride to the section. He was told that he will be working about a half mile inside on the 4 right section. When Joe came out of the bathhouse he saw what looked like a new covered mantrip and figured it would be his ride. A scoop loaded with supplies pulls up and six other miners start climbing on top of it. Two miners get into the bucket next to the supplies. Turn the page and do Question A.

Question A

Joe is surprised when everyone gets on the scoop. What should he do now? (Select as MANY as you think are correct.)

1. Find a spot and climb on board so he won't get left behind.
2. Ask "Why aren't we taking the mantrip?"
3. Tell the crew that it is dangerous and stupid to ride on the scoop.
4. Offer to go get the covered mantrip to use instead of the scoop.
5. Suggest that one scoop be used to haul the supplies and that the miners ride in the bucket of another scoop.

When you have made your selection(s) do the next question.

Question B

Joe gets on top of the battery compartment and the scoop heads inside with the bucket trailing. (See Figure 1 on the next page.) The ride is bumpy and Joe has difficulty hanging on. Eight crosscuts inside the mine, the scoop's front lights flicker and then go out completely. What is the best thing for the foreman to do now? (Choose only ONE unless you are told to "Try Again!")

6. Tell everyone to shine their cap lights ahead and tell the operator to continue to tram the scoop toward the section.
7. Instruct the scoop operator to turn around and use the lights on the other end to continue on.
8. Tell the scoop operator to troubleshoot the electrical problem.
9. Tell everyone to get off, move the scoop to a crosscut, and send someone to get the covered mantrip.
10. Tell the scoop operator to continue on. He is familiar with the roadway.

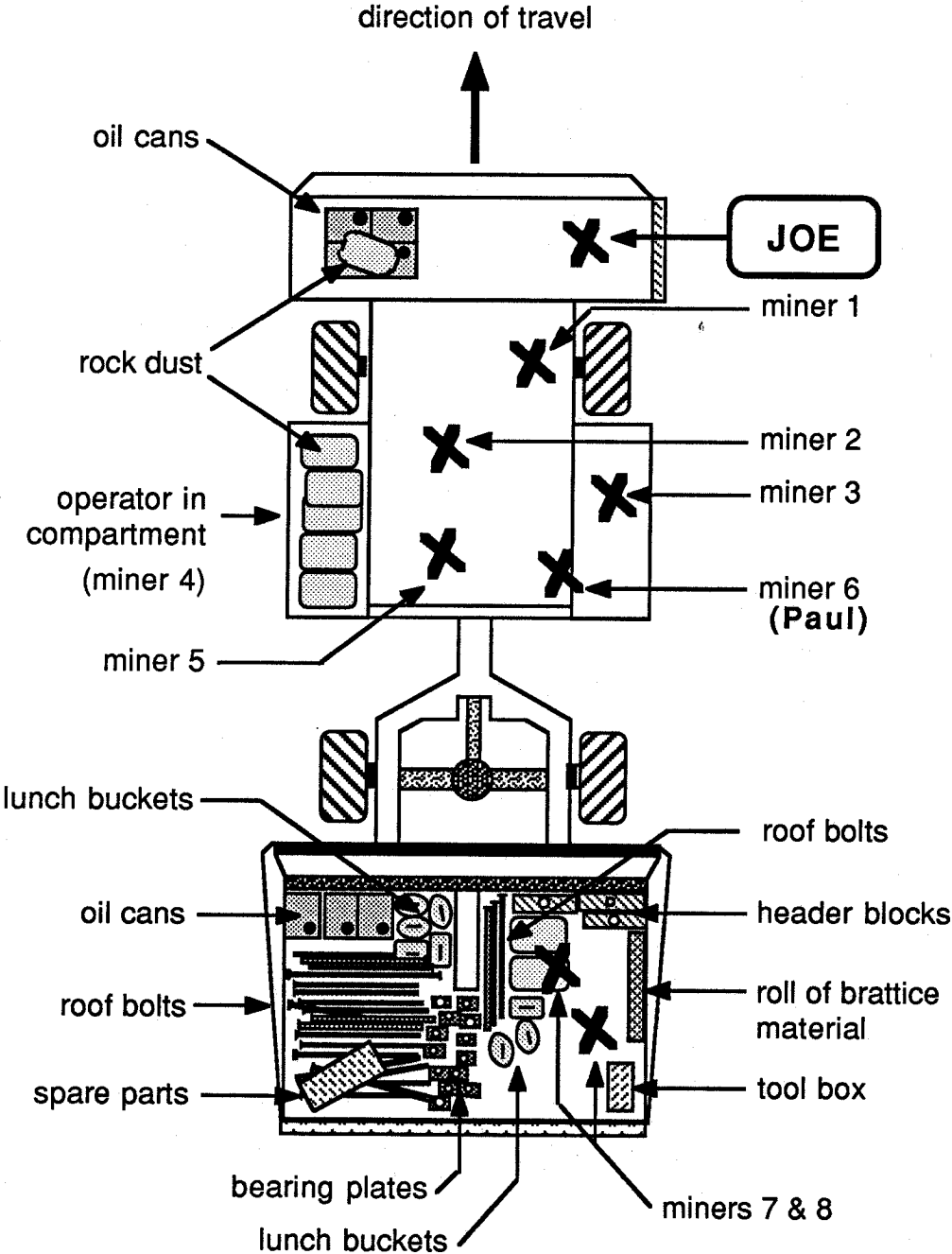


Figure 1: Position of miners and supplies on the scoop

Question C

Joe is straining to keep his cap lamp shining on the roadway while keeping his head from hitting the roof. His hat scrapes the roof twice before the scoop stops at the underground shop, which is about 15 crosscuts in. The two miners who were riding in the bucket get off, taking a few supplies with them. They load more brattice cloth and some cutter bits into the scoop bucket. What is the best thing for Joe to do now? (Choose only ONE unless you are told to "Try Again!")

11. Get off with them.
12. Move to the bucket.
13. Try to get more comfortable for the rest of the ride to the section. Get as low as possible.
14. Lie down, take his hat and cap lamp off and hold them in front of him to help light the way.

Question D

Joe is worried about keeping his job, so reluctantly he gets into the scoop bucket with the remaining supplies. See Figure 2 for the miners' positions on the scoop.

The scoop proceeds at high speed down a steep grade toward the 4 right section. Joe and the supplies in the bucket are bouncing around. As the scoop approaches the dinner hole, someone screams "Stop! Paul's fallen off!" Paul is lying on his back in a puddle of water on the mine floor, just behind the scoop bucket. The scoop has run over him. There is blood on both of Paul's legs just below his knees and he is not moving.

The foreman goes over and kneels by Paul. He keeps saying over and over again, "Paul, are you O. K.? Don't die on me!" All the other miners stand around in a circle and watch. No one touches Paul. What should Joe do now? (Choose only ONE unless you are told to "Try again!")

15. Tell the foreman that he knew this would happen.
16. Take charge! Begin first aid for Paul and direct the others to help.
17. Ask the foreman what he should do.
18. Run to the dinner hole, look for the pager, and call out to the surface.
19. Remember he is new and wait for one of the other miners to take charge.

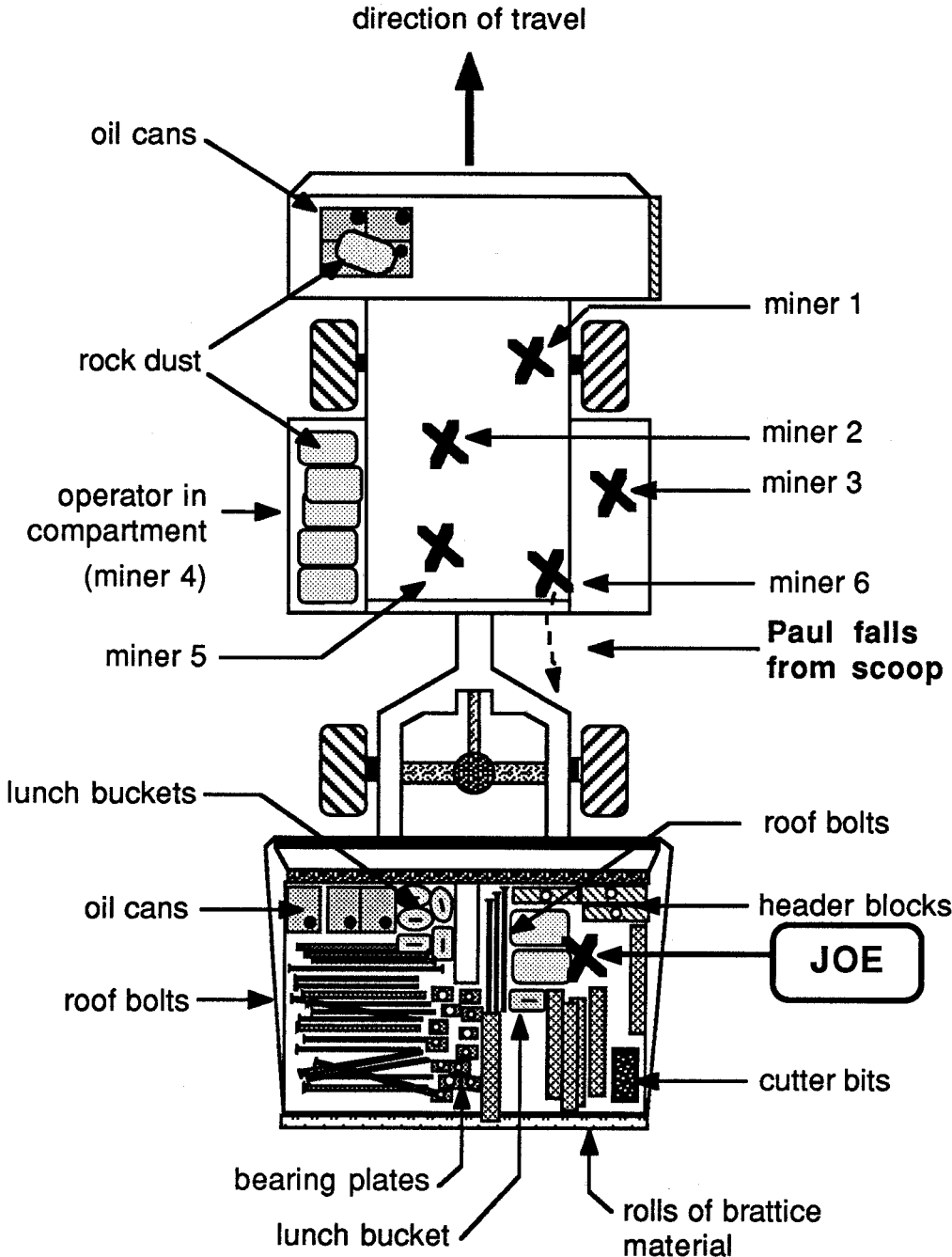


Figure 2: Joe's position in the bucket and the others' positions

Question E

Joe takes charge. He learns that a pager, stretcher, and first aid supplies are located at the dinner hole about 200 feet away. What should Joe do now? (Select as MANY as you think are correct.)

20. Send two miners to get the first aid supplies and a stretcher and to phone outside.
21. Begin checking Paul for injuries.
22. Have two miners put Paul into the scoop bucket for immediate transport outside.
23. Have another miner help him use a clothing drag to pull Paul out of the water and then prop him up against the rib in a dry place.
24. Have someone remove the supplies from the scoop bucket so that Paul can be transported outside.
25. Send someone to get another scoop from the section so that it may be used to transport Paul outside.

When you have made your selection(s), do the next question.

Question F

Joe is nervous about having to use first-aid on an actual victim, but he calms himself down by taking a couple of deep breaths. He kneels down next to Paul, pinches his shoulder, and yells, "Are you OK?" Paul doesn't respond. What should he do now? (Select as MANY as you think are correct.)

- 26. Open Paul's airway by lifting on the back of his neck and gently tilting his head backwards.
- 27. Make sure Paul's airway is open by using the "jaw thrust" method.
- 28. Gently loosen the collar on Paul's shirt.
- 29. Check to see if Paul is breathing.
- 30. Immediately begin treating Paul's leg injuries.
- 31. Prop up Paul's head and shoulders to make him more comfortable.
- 32. Feel Paul's neck pulse.
- 33. Look in Paul's wallet to try to determine any medical problems and his next of kin.

When you have made your selection(s), do the next question.

Question G

Paul begins to moan and say his legs hurt. A miner returns with the second scoop and parks it nearby. Paul is lying flat on his back. Both of his pants legs are soaked with blood about 8 inches below his knees. What should Joe do now? (Select as MANY as you think are correct.)

- 34. Take his pocket knife and slit the lower legs of Paul's pants.
- 35. Prop Paul's legs up about six inches and cover him with a blanket.
- 36. Ask two of the miners to help you immediately move Paul to the scoop bucket.
- 37. Continue checking Paul for injuries.
- 38. Tell Paul that both legs are pretty messed up but you think they can be saved.

When you have made your selection(s) do the next question.

Question H

After slitting Paul's pant legs you see apparent open fractures of both the right and left lower legs. The left leg wound is oozing dark blood. The right leg wound is spurting bright red blood. What is the first thing Joe should do now? (Choose only ONE unless you are told to "Try Again!")

- 39. Use his belt as a tourniquet. Apply it tightly just above the right knee.
- 40. Place Paul on the stretcher so he can be moved out of the mine at once.
- 41. Use a handkerchief and his hand to apply direct pressure to stop the spurting blood.
- 42. Place inflatable splints on both of Paul's legs.
- 43. Apply a sterile dressing over the place where the blood is spurting. Then tie the dressing in place over the wound using a couple of cravat bandages.

Question I

Joe applies direct pressure to the wound on the right leg for about 5 minutes and then sees that the bleeding has nearly stopped. Joe calls another miner over to maintain the pressure while he continues to check the victim. Paul is lying in a puddle of cold water 2 inches deep. He is moaning and says he is cold. His pulse is fast (130) and weak. He is pale and his forehead feels clammy and cold. What should Joe do now? (Select as MANY as you think are correct.)

- 44. Gently lift Paul onto the stretcher. Take him to the surface before he bleeds to death.
- 45. Leave Paul where he is. Pack both lower leg wounds with dressings. Then apply pressure bandages over the dressings.
- 46. Move Paul out of the puddle and onto the stretcher before administering further first aid.
- 47. Leave Paul where he is. After the pressure bandages are in place, splint and immobilize both of his lower legs.

When you have made your selection(s) do the next question.

Question J

Joe decides that Paul's legs must be bandaged, splinted, and immobilized before he can be moved. Joe and another miner quickly apply dressings and pressure bandages to both of Paul's leg wounds. The first aid kit contains 24 cravat bandages and two, three foot long wood splints. How should Joe splint Paul's legs? (Select as MANY as you think are correct.)

- 48. Take an ankle pulse on both legs before and after applying the splint.
- 49. Have another miner help him support both sides of the fracture and carefully lift each leg while a third miner slips a padded splint under the leg.
- 50. Use cravats to secure each leg to its splint. Tie the knots at the edge of the splint, not on top of the wounds on Paul's legs.
- 51. If a bone end sticks through the pressure dressing when he is splinting the right leg, tie the cravat snugly over the protruding bone.
- 52. Before splinting each leg, pull sharply on Paul's foot to straighten out the leg.
- 53. For both of Paul's legs, make sure to tie cravats around the leg and the splint on both sides of the open fracture.

When you have made your selection(s) do the next question.

Question K

Joe has splinted both of Paul's legs. There is no new bleeding around the pressure bandages. Both lower legs are tied to the splints with cravats above and below the fractures. Paul is still lying in the puddle. What should Joe do next? (Choose only ONE unless you are told to "Try Again!")

- 54. Remove Paul's wet clothing before moving him from the puddle so he can be wrapped in a dry blanket after he is placed on the stretcher.
- 55. Grab Paul by his coveralls at his shoulders and drag him onto the stretcher.
- 56. Lift Paul to the stretcher by having three other miners support Paul's legs, hips, and chest with their hands and arms, while Joe holds Paul's head in line with his body.
- 57. Bring up a scoop. Move the bucket close to Paul. Then have three other miners help you log roll Paul into the scoop bucket.

Question L

Joe and three other miners have lifted Paul to the stretcher. They kept his head and body fully supported and immobile during the lift. Paul is now lying on his back on the stretcher in a dry place. The stretcher is padded with a folded dry blanket. Now what should Joe do? (Select as MANY as you think are correct.)

- 58. Tie Paul to the stretcher from the waist down to protect his injured legs, and then transport him to the surface.
- 59. Tie Paul's upper legs, waist, and chest to the stretcher, but leave his head free so that it can be turned to the side if he begins to vomit.
- 60. Tie Paul's upper legs, waist, and chest to the stretcher, and use a blanket roll and cravats to immobilize Paul's head on the stretcher.
- 61. Cover Paul with a blanket or with miners' jackets if no blankets are available.

When you have made your selection(s) do the next question.

Question M

Paul is fully immobilized on his back on the stretcher. No new bleeding has appeared around the pressure bandages. Paul is moaning. His pulse is about 130 and weak. It has been about 20 minutes since he was injured. Now what should Joe do? (Select as MANY as you think are correct.)

- 62. Have two miners carry Paul out on the stretcher.
- 63. Have two miners sit in the scoop bucket with him. Place the stretcher with Paul on it across their legs so they can hold Paul and cushion him on the way out.
- 64. After Paul is loaded into the scoop, tell the scoop operator to get outside as fast as he can.
- 65. Keep the foot end of the stretcher elevated about a foot while Paul is taken out.
- 66. Monitor Paul's breathing and pulse on the way out.
- 67. Watch Paul's pressure dressings for signs of bleeding.
- 68. Talk to Paul on the way out even if he does not respond. Tell him what is being done and that he is doing OK.

When you have made your selection(s) do the next question.

Question N

Paul was taken to an area hospital where he received prompt medical attention. Joe's good first aid care prevented Paul's injuries from being more serious and may have saved his life. After a year of recovery and therapy, Paul was back to normal and working.

Many factors contributed to this accident. Identify those factors that could have been corrected or prevented. (Select as MANY as you think are correct.)

- 69. Joe should have had more task training.
- 70. The scoop operator should have removed all electrical covers and inspection plates and thoroughly checked the lighting circuits before putting the scoop into operation.
- 71. The foreman should not have allowed miners to ride on top of the scoop.
- 72. If a scoop is to be used as a mantrip, only miners and no other equipment should be carried in the bucket.
- 73. The miners should have refused to ride on top of the scoop and also refused to light the way with their cap lamps.
- 74. Extra top should have been taken to make it safer for miners to ride into the section on top of equipment.

When you have made your selection(s) do the next question.

Question O

Suppose you were in Joe's position. You have just started back to work. You need the money. You want to start out right and keep this job. But you are worried about the unsafe work practices you see as you enter the mine. What would you do? Why?

Complete the following statements. Then share your ideas with the other miners and the instructor during the class discussion.

- 75. I would.....(complete your statement on the answer sheet.).....
- 76. I would do this because.....(complete your statement on the answer sheet.).....
- 77. If I did this, what might or might not happen?.....(complete your list on the answer sheet.)

Question P

List all the violations of federal and state laws and your company rules that you can find in this problem. (Write your list on the answer sheet.)

Scoring your performance

- 1. For questions A through N, count the number of responses you colored in that were marked "Correct." Write this number in the first blank on the answer sheet.
- 2. For questions A through N, count the total number of "Incorrect" responses you colored in. Subtract this number from 42. Write the difference in the second blank on the answer sheet.
- 3. Add the numbers on the first and second blanks. This is your score for questions A through N.

The best possible score for questions A through N is 74 and results from selecting all the correct answers and no wrong answers. The worst possible score of zero results from selecting all the wrong answers and no correct answers.

After you complete the exercise, discuss your answers to questions O and P with your classmates and the instructor. As you take part in the discussion, you decide which answers are best for these two questions.

Appendix B: Answer Sheet Blanks

These are the answer sheet blanks. Copies of these blank answer sheets may be duplicated in the normal fashion. However, the answers that are found within the brackets must be printed on these blank answer sheets in invisible ink. These answers are found in Appendix C. If you have the capability to print invisible ink, make copies of the blank answer sheets. Make a master of the answers that appear in Appendix C. Then print the invisible ink on the blank answer sheets, being careful to make sure all pages print and that the appropriate answers line up with the appropriate blanks. The Master Answer Sheet shows all the answers in their proper places.

Most companies and trainers prefer to obtain copies of the preprinted answer sheets from NIOSH, Pittsburgh Research Laboratory, Pittsburgh, PA phone 412-386-5901, fax 412-386-5902 or email to minetraining@cdc.gov.

The exercise is designed to be used in small groups. You will need one answer sheet for each group of 3 to 5 persons in your class. The answer sheets are consumable. You will need a new set for each class.

A developing pen is also needed by each person who marks an answer sheet. These may be obtained from the A. B. Dick Company, P.O. Box 1970, Rochester, New York 14692, phone 1-800-225-4835.

Answer Sheet for Scoop Accident, First Aid Problem

Use this answer sheet to mark your selections. Rub the developing pen gently and smoothly between the brackets. Don't scrub the pen or the message may blur. Be sure to color in the entire message once you make a selection. Otherwise you may not get the information you need.

Question A (Select as MANY as you think are correct.)

- 1. []
- 2. []
[]
- 3. []
[]
- 4. []
[]
- 5. []
[]

Question B (Choose only ONE unless you are told to "Try Again!")

- 6. []
- 7. []
[]
[]
- 8. []
[]
- 9. []
[]
[]
- 10. []

Question C (Choose only ONE unless you are told to "Try Again!")

- 11. []
[]
- 12. []
[]
- 13. []
[]
- 14. []
[]

Question D (Choose only ONE unless you are told to "Try Again!")

- 15. []
- 16. []
- 17. []
- 18. []
- 19. []

Question E (Select as MANY as you think are correct.)

- 20. []
[]
- 21. []
- 22. []
- 23. []
- 24. []
- 25. []

Question F (Select as MANY as you think are correct.)

- 26. []
- 27. []
- 28. []
- 29. []
 []
- 30. []
- 31. []
- 32. []
- 33. []
 []

Question G (Select as MANY as you think are correct.)

- 34. []
 []
- 35. []
- 36. []
- 37. []
- 38. []

Question H (Choose only ONE unless you are told to "Try Again!")

- 39. []
- 40. []
- 41. []
- 42. []
- 43. []

Question I (Select as MANY as you think are correct.)

- 44. []
- 45. []
- 46. []
- 47. []

Question J (Select as MANY as you think are correct.)

- 48. []
- 49. []
- 50. []
- 51. []
- 52. []
- 53. []

Question K (Choose only ONE unless directed to "Try again!")

- 54. []
[]
- 55. []
- 56. []
[]
- 57. []

Question L (Select as MANY as you think are correct.)

- 58. []
- 59. []
- 60. []
- 61. []

Question M (Select as MANY as you think are correct.)

- 62. []
- 63. []
- 64. []
 []
- 65. []
- 66. []
- 67. []
- 68. []

Question N (Select as MANY as you think are correct.)

- 69. []
- 70. []
- 71. []
- 72. []
- 73. []
- 74. []

Question O (Write out your answers.)

75. I would _____

76. I would do this because

77. As a result of my actions what might or might not happen?

Question P List all violations you can find in this problem.

Finding your score for Questions A through N

Number of "Correct" answers you colored in = (1)_____

42 min number of incorrect answers you colored in = (2)_____

Add the values in blanks one and two to get your total score = (3)_____

Highest possible score = 74

Lowest possible score = 0

Appendix C: Invisible ink Answers

These pages contain the answers that must be printed in the blanks of the answer sheet in Appendix B. These answers are spaced and sequenced correctly so that they exactly match up with the appropriate blanks on the answer sheet blank.

Once the answers have been printed in the answer sheet blanks, the developing pen reveals the formerly invisible printed message.

You may obtain preprinted answer sheets or you may prepare your own copies. To learn more about these options, and to determine how many answer sheets and developing pens you will need, see the introductory section of the Instructor's Copy.

This is not a good idea.

Correct! But the foreman tells Joe that the crew says it rides too rough and that they prefer the scoop. He tells Joe to get on.

One of the miners yells, "Who are you calling stupid!" Joe has angered his new co-workers and the foreman.

Correct! But, the foreman says, "You're not task trained to run it. Get on the scoop!"

Correct! But, the foreman says the other scoops are already inside. He tells Joe to climb on.

This is dangerous. Overhead clearance is tight. Try again!

This is dangerous. Men are in the bucket. Try again!

The scoop operator is not a qualified electrician. Try again!

Correct! Getting the mantrip is the best action, but the foreman tells the miners to shine their lamps inby and the scoop operator to continue on. Do the next question.

The light is insufficient for safe operation. Try again!

Correct! But the foreman tells Joe this is not where he'll be working and to get back on the scoop if he wants to keep his job. Do the next question.

Even though Joe is able to get lower now, he should not ride with loose materials in the bucket. Try again!

Joe is at risk while being transported in such overcrowded conditions on top of equipment in low coal. Try again!

Another brush against the top could split Joe's skull. Try again!

The foreman gets mad. He says, "Get off my back!" Try again!

Correct! Paul needs Joe's care immediately. Do next question.

The foreman ignores Joe and keeps telling Paul not to die. Try again!

Joe should not do this at this time. Try again!

Joe waits for half a minute or so, but no one takes charge. Try again!

Correct! One brings the first aid kit while the other calls outside on the pager and then returns with the stretcher.

Correct!

This could cause further injury to Paul.

This could cause further injury to Paul.

This scoop's lights don't work. It shouldn't be used to transport Paul.

Correct! It's a good idea to have a miner get a scoop ready for Paul.

If he has a spinal injury, this action may hurt Paul.

Correct! Joe opens Paul's airway without moving his neck.

Joe does this. Paul doesn't respond.

Correct! Joe sees Paul's chest rise and fall, and he feels air move when he puts his cheek near Paul's mouth.

There is something else Joe should do at this time.

Another miner says, "Don't do that! You'll hurt him!"

Correct! His pulse is fast.

Joe is wasting time. Paul may die.

Correct! Clothing should be removed from injured areas so the extent of injuries can be determined.

This could cause further injury.

This could cause further injury.

Correct!

This won't help. Joe needs to reassure Paul, not scare him.

A tourniquet is a last resort measure. Try again!

This could cause Paul's death. Try again!

Correct! Do the next question.

This could cause Paul's death. Try again!

This could cause Paul's death. Try again!

Paul may die if Joe does this.

Correct! This is needed to keep the bleeding stopped.

This could cause further injury.

Correct! Paul's legs need to be splinted before moving him.

Correct!

Correct!

Correct!

If this happens, Joe is being too rough. Don't do this!

Absolutely not! Only qualified medical personnel should set fractures.

Correct!

This wastes time and causes unnecessary movement that could hurt Paul.
Try again!

This might hurt Paul or kill him. Try again!

Correct! Paul should be treated as if he had a neck fracture. Do the next question.

This might hurt Paul or kill him. Try again!

This is not the correct way to secure Paul to the stretcher.

Vomiting is a concern, but this is not the way to secure Paul to the stretcher.

Correct! Paul may have a neck fracture.

Correct! This will help treat his shock.

This is too slow and difficult. The coal is only 54 inches high. It is too far.

Correct! This will make Paul's ride smoother and prevent further injury.

This could hurt Paul. The roadway is rough. The scoop should be trammed carefully and at a moderate speed.

Correct! This will help Paul's circulation and help treat his shock.

Correct! Paul's condition could worsen. He might vomit.

Correct! But just look. Don't move the dressings or peak under them.

Correct! Even if Paul is unresponsive, reassurance can help him.

This did not contribute to the accident.

This type of maintenance should be done, but only by a qualified electrician.

Correct! It is dangerous to ride on top of equipment and prohibited by law.

Correct! Other materials in the bucket can injure miners during travel.

Correct! Miners have the right to refuse unsafe work orders.

This is impractical and unnecessary.