OMB Control

OMB Control #0693-0043

Expiration: 8/31/2028

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995 unless the information collection has a currently valid OMB Control Number. The approved OMB Control Number for this information collection is 0693-0043. Without this approval, we could not conduct this survey/information collection. Public reporting for this information collection is estimated to be approximately 25 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. All responses to this information collection are voluntary to obtain benefits. Send comments regarding

this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden, to the National Institute of Standards and Technology at: 325 Broadway, Boulder, CO 80305, Attn: Scott Ledgerwood, scott.ledgerwood@nist.gov.

By clicking the next button, you acknowledge that you voluntarily consent to participate in this study.

Pre Training Quiz

Which of the following gases is lighter than air?

- ○ Chlorine
- ○ Methane
- ○ Propane
- ○ Carbon Dioxide

At what height should you hold a gas meter when sampling for gases heavier than air?

- ○ At waist level
- ○ Above your head
- ○ Near the ground
- ○ At chest level

What does it mean if the LEL sensor on an air sampling device triggers but none of the other sensors show an alert?

- ○ There is a potentially explosive atmosphere
- ○ The area is safe
- ○ There is a high concentration of oxygen
- ○ The device is malfunctioning

How are alert levels typically set on an air gas meter?

- User preference
- Standard operating procedures
- Device manufacturer settings
- FEMA guidelines

What is the T-90 time in gas detection?

- The time it takes for a gas detector to calibrate
- The time it takes for a gas detector to reset after an alert
- The time it takes for a gas detector to detect 10% of a gas concentration
- The time it takes for a gas detector to detect 90% of a gas concentration

Which of the following gases is heavier than air?

- Helium

- ○ Ammonia
- ○ Methane
- ○ Hydrogen Sulfide

What should you do if the oxygen (O2) sensor on an air sampling device triggers an alert?

- ○ Increase ventilation in the area
- ○ Check other sensors for additional alerts
- ○ Ignore the alert
- ○ Evacuate the area immediately

Which of the following is a common alert level for oxygen deficiency on an air gas meter?

- ○ 21%
- ○ 18%
- ○ 19.5%

- ○ 23.5%

When conducting air sampling, at what height should you hold a gas meter for gases with similar buoyancy to air?

- ○ At waist level
- ○ At chest level
- ○ Near the ground
- ○ Above your head

What is an action level?

- ○ The concentration of a substance that triggers an action
- ○ The maximum allowable exposure limit for a substance
- ○ The time-weighted average concentration of a substance over an 8-hour workday
- ○ The lowest concentration of a substance detectable by instruments

What is typically the time for the short-term exposure limit?

- 1 hour
- 4 hours
- 8 hours
- 15 minutes

At what percent do most portable gas detectors alarm for LEL?

- 10%
- 50%
- 25%
- 40%

What happens to the oxygen level in air when the contaminant level increases?

- Oxygen level remains constant

- ○ Oxygen level increases
- ○ Oxygen level fluctuates unpredictably
- ○ Oxygen level decreases

What is the typical T-90 time for most gases when detected by portable gas detectors?

- ○ 10 seconds
- ○ 30 seconds
- ○ 90 seconds
- ○ 60 seconds

Return to RA

Thank you. Please return this device to the research assistant.

VRSQ

Please rate how the experience with the HazMat training system made you feel in terms of:

	None	Slight	Moderate	Severe
General Discomfort	○	○	○	○
Fatigue	○	○	○	○
Eyestrain	○	○	○	○
Headache	○	○	○	○
Fullness of Head	○	○	○	○
Difficulty Focusing	○	○	○	○
Blurred Vision	○	○	○	○
Dizzy Eyes Closed	○	○	○	○
Vertigo	○	○	○	○

SPES

Please choose the appropriate response based on your experience with the HazMat training system

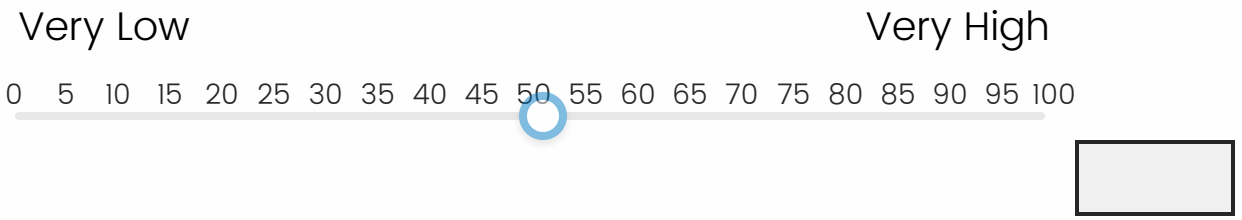
	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I felt like I was actually there in the environment of the presentation.	○	○	○	○	○
It was as though my true location had shifted into the environment in the presentation.	○	○	○	○	○
I felt as though I was physically present in the environment of the presentation.	○	○	○	○	○
It seemed as though I actually took part in the action of the presentation.	○	○	○	○	○

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I had the impression that I could be active in the environment of the presentation.	○	○	○	○	○
I felt like I could move around among the objects in the presentation.	○	○	○	○	○
The objects in the presentation gave me the feeling that I could do things with them.	○	○	○	○	○
It seemed to me that I could do whatever I wanted in the environment of the presentation.	○	○	○	○	○

NTLX Questionnaire

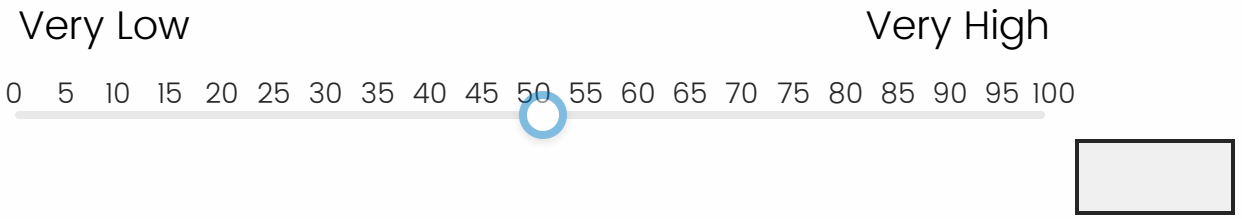
Mental Demand

How mentally demanding was the task?



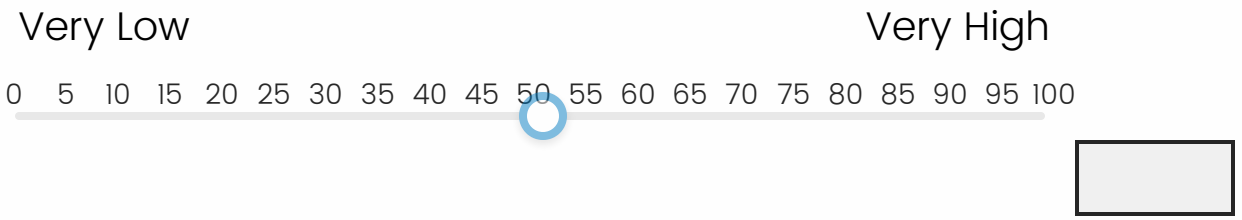
Physical Demand

How physically demanding was the task?



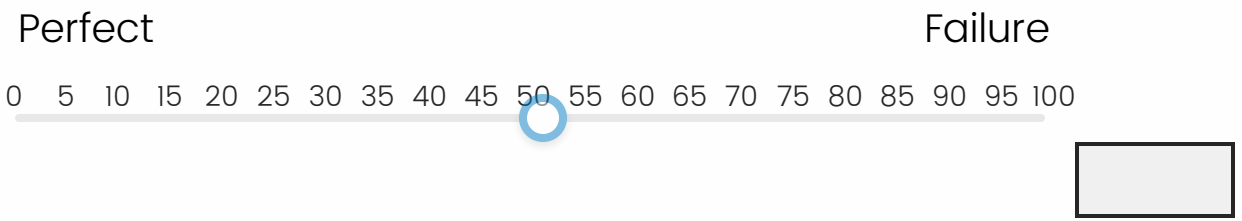
Temporal Demand

How hurried or rushed was the pace of the task?



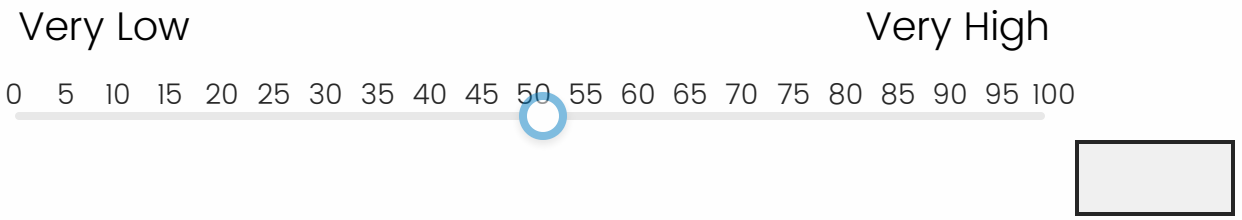
Performance

How successful were you in accomplishing what you were asked to do?



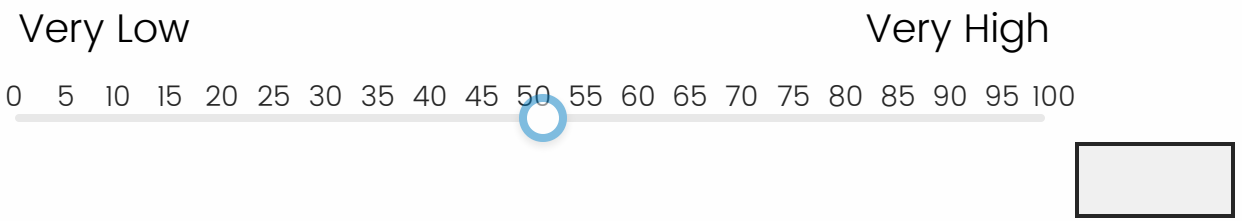
Effort

How hard did you have to work to accomplish your level of performance?



Frustration

How insecure, discouraged, irritated, stressed, and annoyed were you?



Post Training Quiz

Which of the following gases is lighter than air?

○ Chlorine

- ○ Carbon Dioxide
- ○ Propane
- ○ Methane

At what height should you hold a gas meter when sampling for gases heavier than air?

- ○ Near the ground
- ○ At waist level
- ○ Above your head
- ○ At chest level

What does it mean if the LEL sensor on an air sampling device triggers but none of the other sensors show an alert?

- ○ There is a potentially explosive atmosphere
- ○ The area is safe
- ○ There is a high concentration of oxygen

- ○ The device is malfunctioning

How are alert levels typically set on an air gas meter?

- ○ Device manufacturer settings
- ○ User preference
- ○ FEMA guidelines
- ○ Standard operating procedures

What is the T-90 time in gas detection?

- ○ The time it takes for a gas detector to reset after an alert
- ○ The time it takes for a gas detector to detect 90% of a gas concentration
- ○ The time it takes for a gas detector to detect 10% of a gas concentration
- ○ The time it takes for a gas detector to calibrate

Which of the following gases is heavier than air?

- ○ Methane
- ○ Helium
- ○ Ammonia
- ○ Hydrogen Sulfide

What should you do if the oxygen (O2) sensor on an air sampling device triggers an alert?

- ○ Ignore the alert
- ○ Evacuate the area immediately
- ○ Check other sensors for additional alerts
- ○ Increase ventilation in the area

Which of the following is a common alert level for oxygen deficiency on an air gas meter?

- ○ 19.5%

- ○ 21%
- ○ 18%
- ○ 23.5%

When conducting air sampling, at what height should you hold a gas meter for gases with similar buoyancy to air?

- ○ At waist level
- ○ Above your head
- ○ Near the ground
- ○ At chest level

What is an action level?

- ○ The concentration of a substance that triggers an action
- ○ The maximum allowable exposure limit for a substance
- ○ The time-weighted average concentration of a substance over an 8-hour workday
- ○ The lowest concentration of a substance detectable by instruments

What is typically the time for the short-term exposure limit?

- 4 hours
- 1 hour
- 15 minutes
- 8 hours

At what percent do most portable gas detectors alarm for LEL?

- 40%
- 10%
- 25%
- 50%

What happens to the oxygen level in air when the

contaminant level increases?

- ○ Oxygen level remains constant
- ○ Oxygen level decreases
- ○ Oxygen level increases
- ○ Oxygen level fluctuates unpredictably

What is the typical T-90 time for most gases when detected by portable gas detectors?

- ○ 90 seconds
- ○ 10 seconds
- ○ 30 seconds
- ○ 60 seconds

Return to RA

Thank you. Please return this device to the research

assistant.

RIMMS Questionnaire

Please choose the appropriate response based on your experience with the HazMat training system

	Not True	Slightly True	Moderately True	Mostly True	Very True
The quality of the information provided helped to hold my attention	○	○	○	○	○
The way the information is arranged and presented helped keep my attention	○	○	○	○	○
The variety of provided information (video, hands-on, etc.) helped keep my attention	○	○	○	○	○
It is clear to me that the contents of this training experience are related to things I already know	○	○	○	○	○
The content and style of user instruction convey the impression that learning how to conduct air monitoring is worth it	○	○	○	○	○

	Not True	Slightly True	Moderately True	Mostly True	Very True
The training concepts will be useful to me	○	○	○	○	○

	Not True	Slightly True	Moderately True	Mostly True	Very True
As I worked with the training experience, I was confident that I would be able to complete exercises with the air monitor	○	○	○	○	○
After working on this experience, I was confident that I would be able to pass a practical evaluation on it	○	○	○	○	○
The organization of the training helped me be confident in learning this topic	○	○	○	○	○
I enjoyed working with these user instructions so much that I was stimulated to keep on working	○	○	○	○	○
I really enjoyed working with these user instructions	○	○	○	○	○

	Not True	Slightly True	Moderately True	Mostly True	Very True
It was a pleasure to work with such well-designed user instructions	○	○	○	○	○

Open Feedback

What aspects of the training session did you find particularly helpful for learning the task?

What aspects of the training session made the task more challenging to learn?

Do you have any other thoughts or feedback about the training or task used in this study?

Demographics

What is your sex?

- ○ Male
- ○ Female

What is your age?

What is your primary first responder role?

How many years of experience do you have as a first responder?

Prior to today, have you ever tried Virtual Reality (VR)?

Yes ○ No ○

Gift Code

Thank you again for participating!

Here is your gift card code: **CARD_CODE_FOR_1**

Please scan the QR code to input your gift codes into your Amazon account.

Thank you

Thank you for taking part in our study. You may return the device to the research assistant.