SATERN: Overview of Online Exams

version 5.8 SP5

SATERN
System for Administration Training and Education Resources for NASA

For Plateau Learning v 5.8 SP5
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Table of Contents

Lesson 1: How Exams Work in SATERN 1

Lesson Objectives 1

Steps to Implement an Online Exam 2

Main Concepts of Exam Objects 3

Lab 1. Log In to SATERN and Take an Exam Step 3

Configuration Options for Online Exams 4

How Exams are Generated 5

Assigning Point Values 5

Questions in an Exam 5

Decisions when Configuring an Exam 6

Lab 2. Research an Existing Exam 7

Adding an Exam Object to an Item 9

Lab 3. Add an Exam to an Existing Item 11

Generating Printed Exams 12

Run Reports Related to Exams 15

Lesson Conclusion 16

Lesson Check 17

Optional Topic: How to Implement Adaptive Learning 18

Objectives Support Question Pools 18

Question Pooling/Randomization 20

Topic Check 21

Lesson 1:
How Exams Work in SATERN

The goal for Lesson 1 is to be able to explain the concepts of exams and how they can be configured in SATERN. Taking an exam as a user helps you understand the variety of options that SATERN supports.

You will attach an existing exam to an item, then log in as a user and make sure that the exam behaves as desired.

LESSON OBJECTIVES

Upon completion of this lesson, you will be able to:

- List the steps involved in creating an online exam
- Describe the purpose of the Plateau Question Editor (PQE)
- Explain options available when configuring online exams
- Describe the characteristics of a Plateau online exam
- Research an existing exam
- Associate an exam to an item

STEPS TO IMPLEMENT AN ONLINE EXAM

You may not be the SATERN admin responsible for performing all steps in the process for implementing an online exam. But it is helpful to have an overview of the process and to know that someone at NASA needs to:

1. Create questions in Plateau Question Editor (PQE) related to an item.
2. *Optional:* Identify and create learning objectives for items and online content.
3. Add a new exam from the **Content > Exam Object** menu.
4. Associate questions (and objectives if desired) with the exam.
5. Create a new item or edit an existing item.
6. Add the exam object to the item in the **Online Settings** tab.
7. Define online settings for the item and this exam.
8. Test the item and exam in the SATERN user interface.

This lesson provides the overview necessary to understand what happens at each step. Then you will be better able to figure our which steps you perform, where you go to do this step, and what happens next.

MAIN CONCEPTS OF EXAM OBJECTS

A SATERN exam object consists of questions that display to learners when they launch the item from their learning plan. All SATERN exam objects are graded and the score is captured in learners learning history files.

To understand the variety of exam behavior, it is best to log in to SATERN as a user and take an existing exam. This illustrates the discussion that follows.

Lab 1. Log In to SATERN and Take an Exam

Step

1. Log in as a SATERN user.
2. Navigate to the item your instructor provides _____
3. Locate and launch the exam.
4. The first time you take the exam, you should deliberately fail the exam.
5. Log in again and pass the exam.
6. Make notes about exam behavior as you go through the lab.

CONFIGURATION OPTIONS FOR ONLINE EXAMS

You can include messages that display to learners before, during, and after they complete the exam.

You can also define many other software behaviors and management criteria with regard to the exam. Some of these include minimum required score for passing, the number of times that learners are allowed to attempt the exam, the ability to specify whether learners must answer the questions in sequence, the actions and updates that are performed when learners pass or fail the exam, and whether a proctor code must be used to start the exam (requires use of the SATERN Instructor entity).

For learners to take exams, you must associate them with an item in the **Online Settings** tab of the item record.

Key points related to working with exams include:

- Set up exam object with:
  - Exam messages to guide learners
  - Time limit, if desired
  - Feedback during exam completion
- Organize exam to be sequential (learners must proceed in order) or freeform (learners can skip questions and come back)
- Define treatment for exam results

HOW EXAMS ARE GENERATED

There are two methods for including questions on an exam:

- Guarantee the inclusion of specific questions on the exam
- Randomly select those questions that are related to specific objectives

Assigning Point Values

The *Point Value* field of a question record allows you to determine the relative value of each question from a scoring standpoint.

Questions in an Exam

Each question tracks numerous statistics, such as:

- Where the question is being used
- How learners have performed in answering the question
- Which learners took which exams
- How many times the learners attempted each exam
- Whether or not the learner answered the question
- How the learner answered the question
- The learner's duration in the exam
- The points earned out of total points assigned to the question
- The amount of time it took the learner to answer the question
- An answer summary indicating the distractor answer selected

DECISIONS WHEN CONFIGURING AN EXAM

When creating an exam in SATERN, the admin makes decisions such as :

- Define the exam type as sequential or free-form
- Determine total number of questions to be included
- Define the pass percentage, maximum number of tries, and duration of the exam (if the exam is timed)
- Decide when the exam taker sees feedback
- Decide whether the test taker sees exam scoring
- Determine if the exam results should be analyzed

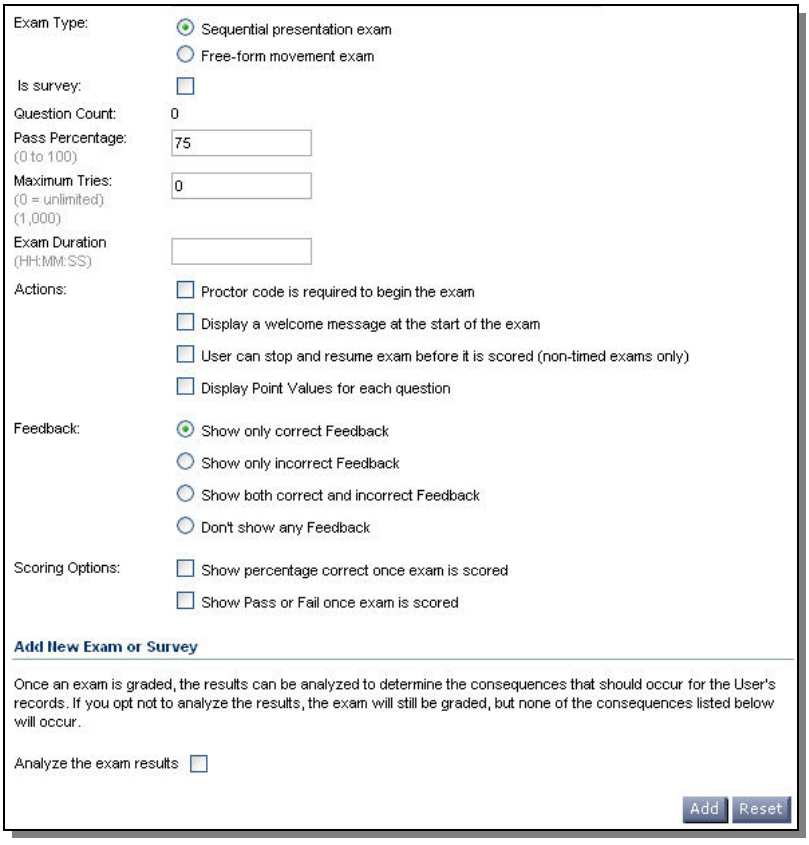


Figure 1. Exam Object Set Up Options

Lab 2. Research an Existing Exam

Step

1. Navigate to **Content > Exam Objects**.

2. Search for the exam object you would like to research.

3. Select **View** to look at additional details about the Exam (Figure 2).

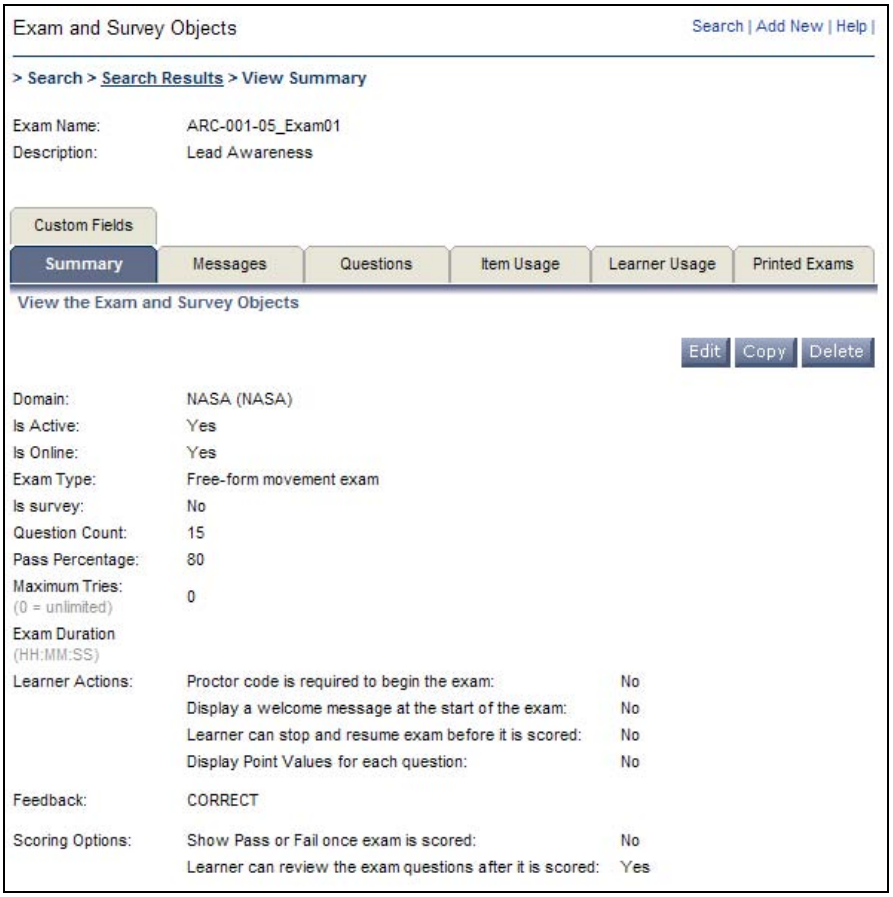


Figure 2. Previewing an Exam Object

4. Click the **Questions** tab (Figure 3).

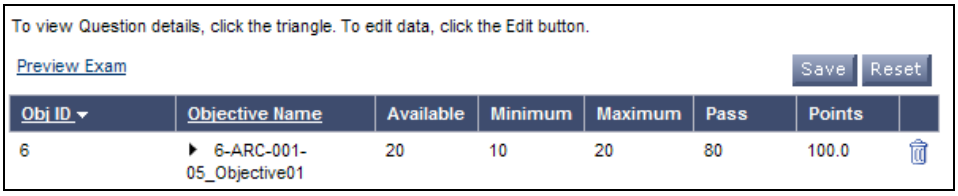


Figure 3. The Questions Tab for an Exam

5. Click the **Preview Exam** link to view the exam as it appears at run time (Figure 4).

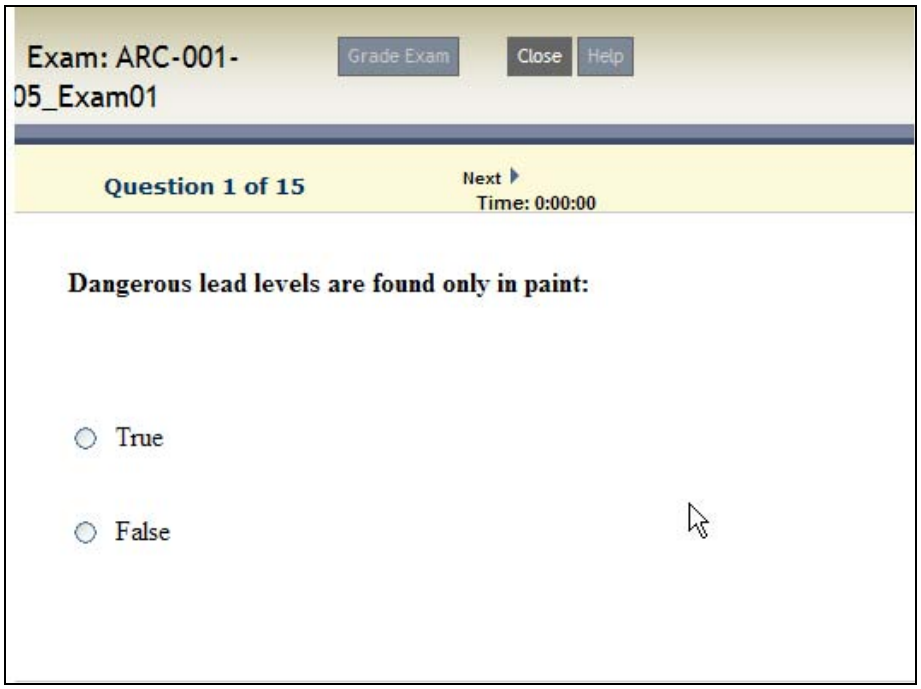


Figure 4. Exam Preview

6. Click **Close** to return to your exam object record.

ADDING AN EXAM OBJECT TO AN ITEM

After an exam has been defined, the next steps to implement an exam are to:

1. Create an online item or add the exam object to an existing item.
2. Define the online settings to include the exam.

To add an exam object to an item click the **Online Settings** tab of the item record. Once the online settings are input and changes applied, the content structure was automatically created when you created the item with online content (see the *Online Content Management* training guide for more information). Scroll to the bottom of the screen to view the content structure (Figure 5).

Figure 5. Content Structure

To add the exam object to the Item:

1. Click the **Edit** link for the top-level object to add an exam object or content object.
2. Enter an object label.
3. Select the **Exams/Survey** radio button.
4. Enter (or search) an exam name.
5. Select the Exam

6. Select/enter other settings (Figure 6.):

Option	Description
Restrict access to other online item objects when this exam is in progress..	Prevents learners from launching content objects associated with the item while taking the exam
Mark item completed when exam passed.	This writes a "For Credit" entry to the learner's learning history upon completion of the exam, regardless whether they have completed other content objects associated to the item.
Mark item failed when exam failed.	This writes a "Not For Credit" entry to learner's learning history upon failure of exam.
Timed Exam	This designates the amount of time a learner has to complete the exam.
After scoring exam.	These options deal with whether learner can/must review questions after they complete the exam.

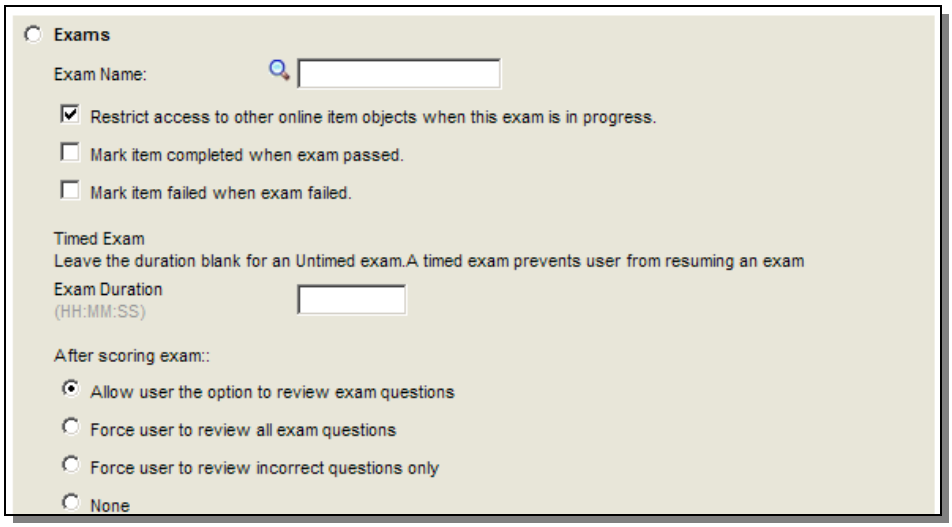


Figure 6. Object Screen

7. Click **Add** to see the objects (Figure 7.).

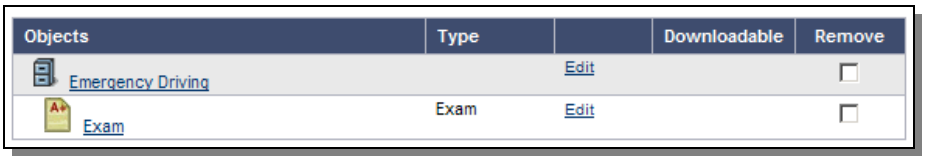


Figure 7. Object Screen

Lab 3. Add an Exam to an Existing Item

Step

1. Navigate to **Learning > Items**.
2. Enter search criteria to search for the item.
3. Click **Search**.
4. Locate the item and click the **edit icon** to access the item in edit mode.
5. Select the **Online Settings** tab.
6. Check the **Item is Online** checkbox.
7. Select an **online completion/failure status** from the drop-down menu.
8. Make other changes as necessary.
9. Click **Apply Changes**.
10. Scroll down to the Objects list and click the **edit** link for the filing cabinet.
11. Scroll down to the *Add an Object to the Structure* section and enter the object label.
12. Click the **Exam/Survey** radio button.
13. Search for the exam to add to the item.
14. Set the **Mark item…** and **After** scoring exam options.
15. Click **Add**.
16. Assign the item to a learner.
17. Log in to the learner interface, launch the item, and test the exam.

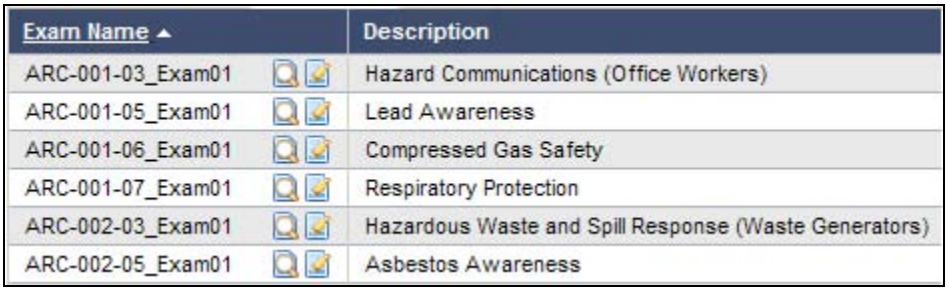
GENERATING PRINTED EXAMS

You can create a printed exam for learners from any existing exam module that has been associated with an item. Once completed, an admin can record each learner's answer choices manually through the system. Plateau Learning automatically grades each exam and a learning event is recorded for each. You can only print exams if you have active questions associated with the exam.

Each time a new exam is generated for printing, it is assigned a unique Exam Sequence ID. The questions for each printed exam are selected based on the settings established for the exam on the various tabs in the Exam Objects section. The sequence of the exam questions for each exam sequence is always randomized regardless of the settings in the Exam Objects section. An instructor can either give each person in the class a completely different printed exam or give each learner a copy of exactly the same exam.

To print an exam:

1. Navigate to **Content > Exam Objects**.
2. Enter search criteria to search for an exam and click **Search**.
3. Click the **edit icon** (Figure 8.)



Exam Name ▲	Description
ARC-001-03_Exam01	Hazard Communications (Office Workers)
ARC-001-05_Exam01	Lead Awareness
ARC-001-06_Exam01	Compressed Gas Safety
ARC-001-07_Exam01	Respiratory Protection
ARC-002-03_Exam01	Hazardous Waste and Spill Response (Waste Generators)
ARC-002-05_Exam01	Asbestos Awareness

Figure 8. Search Results

4. Click the **Printed Exams** tab (Figure 9.).

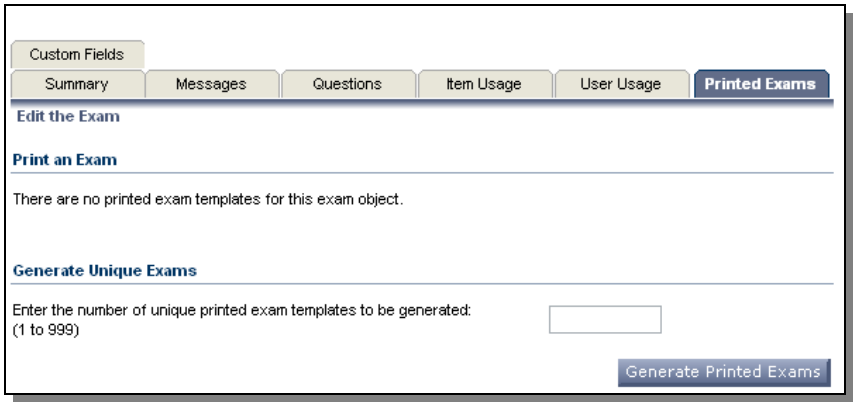


Figure 9. Printed Exams Tab

5. Enter the number of exams to generate and print in the Generate Unique Exam textbox.
6. Click **Generate Printed Exams**.

   Your exam is listed in the Print an Exam section of the screen (1).

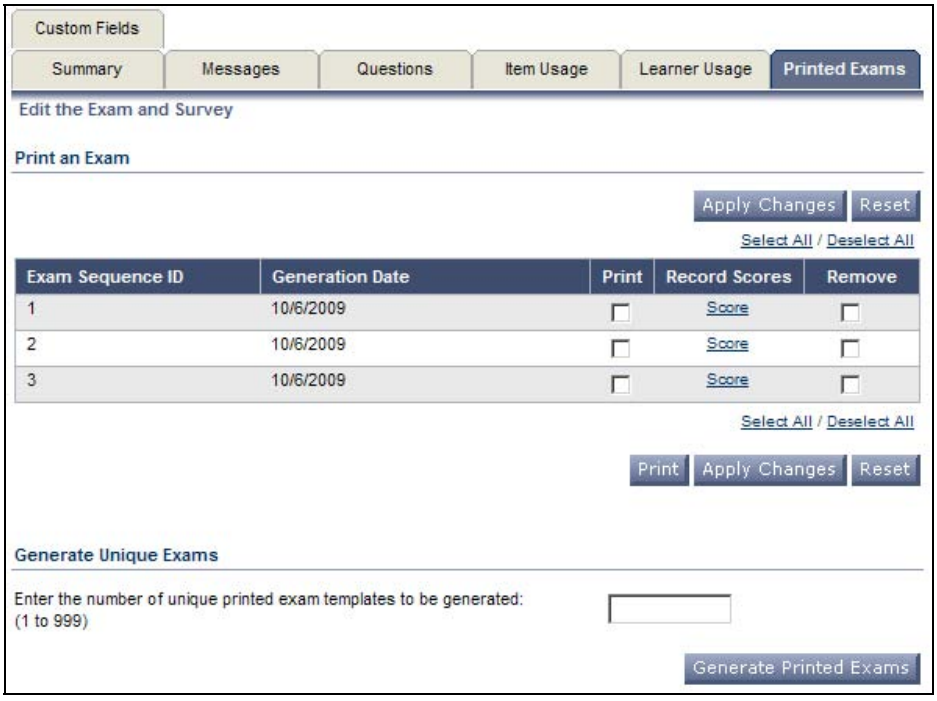
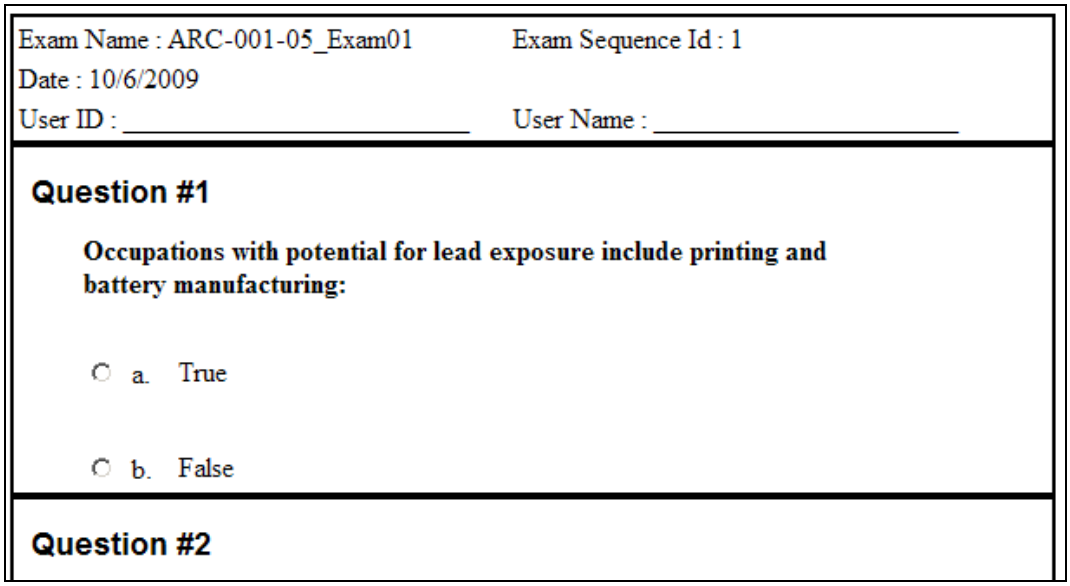


Figure 10. Print an Exam

7. Click the **Print** checkbox for each exam you want to print.

8. Click **Print** to displays the exam in a separate browser window in a printable format (2).



Exam Name : ARC-001-05_Exam01 Exam Sequence Id : 1
Date : 10/6/2009
User ID : _____ User Name : _____

Question #1

Occupations with potential for lead exposure include printing and battery manufacturing:

○ a. True

○ b. False

Question #2

Figure 11. Exam in Printable Format

9. Use your browser menu to print the exam.
10. To grade the exam, click the **Score** link on Printed Exams tab of the exam object record. Complete the grading wizard. You need to provide the learner ID and the exam sequence ID.

RUN REPORTS RELATED TO EXAMS

The following reports in SATERN relate to topics presented in this lesson:

- Exam Item Analysis
- Exam Objects
- Learner Exam Data

LESSON CONCLUSION

In this lesson, you learned how to create an exam object. Using the step-by-step instructions provided, you created an exam, placed the questions into the exam, and modified the appropriate learner and system parameters. Additionally, you created an online item and included the exam object.

You should now be able to:

- List the steps involved in creating an online exam
- Describe the purpose of the Plateau Question Editor (PQE)
- Explain options available when configuring online exams
- Describe the characteristics of a Plateau online exam
- Research an existing exam
- Associate an exam to an item

LESSON CHECK

Use what you learned in this lesson to answer the following questions.

1. What are the two types of exams?

2. True or False:

   Exams can be timed.

3. True or False:

   An exam object can be directly assigned to learners.

OPTIONAL TOPIC: HOW TO IMPLEMENT ADAPTIVE LEARNING

Adaptive tests use the objective as a connection between content objects and test questions in an item. If a learner passes an objective, he/she also passes the content object.

Objectives provide a way for the system to identify learner learning needs, based on exam results:

1. Define a content object with desired objectives.
2. Configure an exam with questions that test these objectives.
3. Add the content object and the exam object to an item.
4. Set up the item so objective status matches exam results:
   - If learner passes the objectives associated with a content object, the status of the content object is set to *Complete*.
   - If learner fails the objectives associated with a content object, the content object is *Incomplete*

Objectives Support Question Pools

Objectives can be used to generate a pool of question variants available for an exam. Consider the following scenario:

You associated objective ABC with five questions:

Question	Variant	Question Stem
101	1	The Earth has this many oceans…
	2	Which of the following is not an ocean?
102	1	How many continents are there?
	2	There are _____ continents.
103	1	China is on the continent…
	2	Asia includes which country?
	3	China is not on the continent of Asia. (true/false)
104	1	How many continents are on the western hemisphere?
105	1	Is a continent a body of water or land?

You define rules for the system to use when selecting questions, such as:

- Question 105, variant 1 must always appear in the exam
- System should select a minimum of 3 and maximum of 5 questions

Here is how the objective-based questions display in two exam iterations (Figure 12):

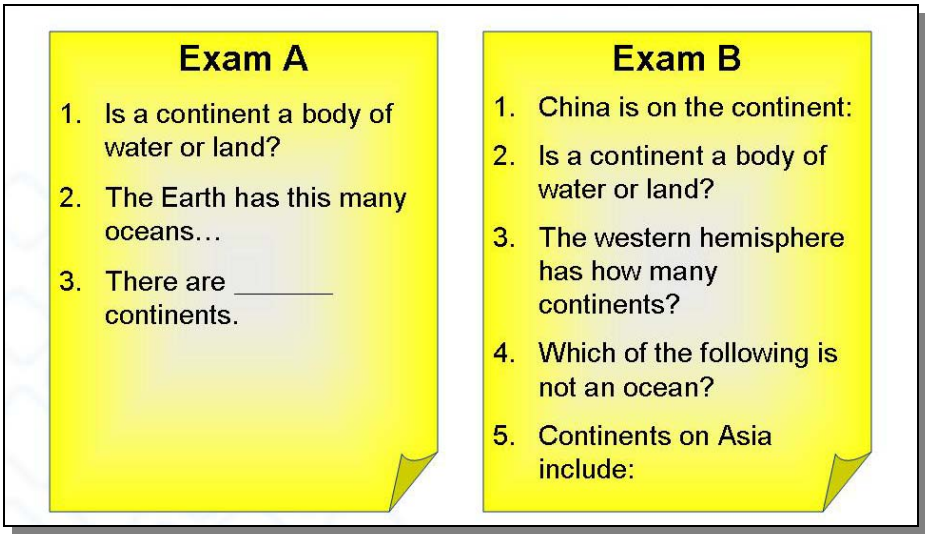


Figure 12. Two Iterations of an Objective-Based Exam

Business Guidelines

If SATERN admins want to set up adaptive learning, you should work with the NSSC staff who will create the questions and objectives. Then provide instructions so that the NSSC can set up the relationships.

Question Pooling/Randomization

Question pooling/randomization occurs when an exam is created by the assignment of questions through objectives. As a rule, the smaller the difference between the number of available questions and the minimum questions assigned to be used, the lesser the degree of randomness.

For example, if an exam is defined to include 10 questions, and the available number of questions (based on the objectives that have been assigned) is 20; that makes a pool of 10 questions available for use in the exam.

Available = 20 in the pool

Minimum = 10 total to be used in exam

If you specify the same value for minimum questions to be used as the value for available questions, randomness is eliminated.

Available = 10 in pool

Minimum = 10 total to be used in exam

You also set the number of points associated with each objective. So if you set the points = 50 and there are 10 questions, each question is worth 5 points. If you set a range for the number of questions to be asked per objective, the points are distributed equally amongst each question presented to the learner.

Objective Points = 50

- ✓ 5 questions presented, each question = 10 points
- ✓ 7 questions presented, each question = 7.14 points
- ✓ 10 questions presented, each question = 5 points

TOPIC CHECK

Use what you learned in this lesson to answer the following questions.

1. True or False:

   A question can be tied to more than one objective,

2. True or False:

   An objective can be tied to more than one content object.

3. Which of the following can you not do when a learner fails an exam and adaptive learning has been established:
   a) Clear the flags for all failed objectives
   b) Set the completion flags for all passed objectives
   c) Lock the exam
   d) Remove the item from the learning plan

NOTES