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EGAD - The Electronic Grisham and Dwyer

The following documents details the user experience for the Electronic Grisham and Dwyer Chemistry project.

EGAD - The Electronic Grisham and Dwyer
Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

2 of **22**

Table of Contents

EGAD - The Electronic Grisham and Dwyer
Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

3 **of** **22**

Stakeholders

Stakeholder Name	Phone	Email	Role	Skype
Charles Grisham		cmg.eservices.virginia.edu	Author	
Tammy Dwyer		tdwyer@sandiego.edu	Author	
David Quinn		DQuinn@bfwpub.com	Editorial Lead	
Anthony Palmiotto		apalmiotto@whfreeman.com	Editorial Lead	
David Fusilier			UX/UI Designer	
Vera			Flash Developer	
Mary			Illustrator	
Lee			Problems Auther	
Justin Beals	(212) 754-0472	jbeals@bfwpub.com	UX Director	justinbeals
Rob Powers	(812) 201-6196	rpowers.contractor@bfwpub.com	UX/UI Designer	robertjpowers

EGAD - The Electronic Grisham and Dwyer
Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

4 of 22

Glossary

Guided Solution

Previous know as a "Chem Cast". This particular type of resource is similar to a one on one interaction with an instructor. The goals of a guided solution would be to explain a concept to a student by walking them through example videos and then allowing them to practice similar problems.

UX: *tba*

Learning Objective

A learning objective is a conceptual goal that the student needs to pull from the material in order to consider it mastered. Learning objectives will be aligned to exam items and resources. This allignment will allow the system to suggest practice resources based on performance.

Note: *Px currently contains learning objectives however they do no align to the question but rather the entire assessment.*

Practice Exam

The practice Exam is located in one of the divisions of a syllabus. Items is a practice exam are correlated to learning objectives which will allow the item to indicate resources to be studied.

Resource

A resource is any type of learning material in the syllabus. e.g. eBook, Quiz, Activity, etc.

Resources unique to the EGAD project will be detailed in this documentation.

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Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

5 of **22**

Sample scenarios for using EGAD

11-18-2011

Three students walk out of their introductory chemistry lecture, planning to do this week's homework assignment and also prepare for the approaching exam. One (student A) is a top-notch student from a good high school. Another (student B) is a very bright student, but only studies chemistry 3-4 hours per week. He thinks he will have no trouble getting an A in the course. A third (student C) is a weak student who had an inadequate preparation in her high-school chemistry course. How can EGAD help each of these students?

Student A

She is pretty sure that she knows the material for the next exam, so she goes right to the online practice exam questions. She does two practice exams, a total of 30 questions, and scores a 24. She clicks to the concept map, which is highlighted to indicate that all six incorrect answers were in two areas – partial pressure of gases and the van der Waals constants for real gases. She is pretty sure that she knows the material in both areas, and decides to verify this by doing four practice problems in each area. She gets only one problem correct in partial pressures, and only two correct in real gas calculations. The online advisor (in software) pops up to show the chapter concept map again. This time the map shows her weak performance may be based on misunderstanding of the mole fraction concept, and it also suggests that she look at tutorials in each of these areas, which she does. Working through the tutorial on partial pressures, she realizes that she has misunderstood how to calculate mole fractions, clicks on the link to the mole fraction tutorial, and returns to successfully solve four problems on partial pressures. She follows the same procedure to explore her misunderstanding of real gas calculations, and the concept map helps her to see (because there is a box for it on the map) that she has misunderstood the van der Waals "a" constant, which corrects the ideal gas equation for intermolecular forces. Watching the recommended tutorials and working linked problems, she finally returns to practice exams, and scores 30/30 on two new practice quizzes.

Student B

He skips reading the chapter text and goes directly to the assigned homework problems for the week. When he submits his assignment for grading, he finds his score to be 5 correct out of 10 possible. He complains that he actually understands the material to his instructor, who suggests that he look at the concept-map assessment features online. He does this, and the map is highlighted so that it tells him that his mistakes were in 5 different conceptual areas. He clicks on each of these 5 areas and successfully answers two conceptual questions in each. He returns to the 5 incorrect homework problems and refers to the tutorials to work through each of them. He discovers that each of the problems he answered incorrectly involved a calculation error. The concept map is still blinking in the 5 problem areas, so he selects a practice problem from each of these map areas, and checks his calculations more carefully as he does the problems, and he successfully completes all five. He then chooses a practice exam on the same chapter material and works through it, checking his calculations carefully on each problem, and he scores 14 correct out of 15 problems.

Student C

She was, quite frankly, very confused by the last three class lectures, so she talks to the instructor after class. The instructor suggests the online tutorials, noting that they will walk her step-by-step through the material and also allow her to watch solved example problems and let her try problems as she goes along. The student works through the tutorial for the chapter on gases, answering conceptual questions as she goes. She finds that several of the conceptual questions are confusing, and she has to try several times to answer them correctly, but she still doesn't really even understand what she doesn't understand. After completing the tutorial, she tries the assessment feature on the concept map, and the map lights up to show that her problems are concentrated in four conceptual areas. She clicks each of these areas in turn, to open the online ebook, and reads each section carefully, gets out paper and pencil and works through several worked/solved problems in the step-by-step way that they are given. Returning to the concept map, she clicks for end-of-chapter problems in each of the four areas, and she tries three problems in each, completing most of them successfully. She tries a practice exam, scoring a 10 out of 15. The practice exam has a concept-map link. When she clicks on that, the map now tells her that all five incorrect answers were in two of the four areas that previously troubled her. The student reviews the two problem areas by choosing "go to tutorial" from each area of the map, and works through new practice problems in each area, eventually improving her skills and her performance.

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Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

6 of **22**

Previous Notes and Documentation

Sample: http://mediasparkles.com/grisham/ChemPlayer/chapter4.html

- We like these for the most part – not the design or the voice, but the general approach. Instructors are very supportive of this, and it mimics almost exactly the effective aspect of smartPhysics.

- We would need them to exist in a different type of player. This player is all in flash, and thus can't allow too much customization nor can it allow too many different content types to be easily displayed. A player in another format will allow us to mix and match content. I have a functioning prototype for that for smartPhysics 2.0, but I'm not sure if it would work in PX.

- We'd like to explore different types of active learning and interactivity.

- We would need to capture student activity data. In smartPhysics, we capture every student action (load, start, stop, change slide, etc.), which is highly informational but a load on the database. I think we could do less, but we need general time on task and related data points.

Prototype with the three frames: http://dl.dropbox.com/u/8665558/_To_Client/Worth/ Chemistry/04262011/index.html

- We see this as a destination within the system, such as after you're doing problems or after you navigate into the content from a TOC or concept map.

- While I think we want to do away with the forced "three framing," we do like the ability for two or even three things to go on at once. You and us and most profs figure that students will do one at a time, but how easy would it be to have them working like a Mac user (like you) having a couple of things going on at once, and would that be helpful? I don't know.

- Some profs actually ask for a fourth section, with more course administrative things. Crazy.

Finally, here's just an idea of how they want some aspects of concept maps to work: http:// mediasparkles.com/grisham/assessment/AssessmentPrototype.html

- Hover stoichometry (the big blue thing in the middle) and balancing chemical equations (right-side pinkish) and you should get navigation

-----

Where we are:

Without rehashing too much, the primary instructional driver in our initial prototype was a narrated/animated tutorial similar to the smartPhysics PreLectures, which the research has shown to be highly effective in aiding retention and producing better scores and improving attitudes. However, since then, the instructor feedback (we've had a lot of it) has been what I'll call a "positive gloss over" of these tutorials, along the lines of "Yes, they definitely do the job and students will prefer watching them, so congrats. But we really need to talk about problem solving."

As a result, the authors have turned to considering problem sets, interactivity related to problem-solving, connecting problem solving to their content, and so on. They've even mocked up a problem-solving module in Flash to display the types of questions they'd want to ask, and so on.

Where we'd like to be:

I'm no longer tied to three frames, any frames, etc. I think that we'll build a learning methodology around question sets leading to tutorials leading to text and other support, but it does need to be flexible. All in all, I see the tutorials as the unique factor here, as in smartPhysics, but the success of the program relies heavily in how they are employed. (In smartPhysics, passive viewing yields no results; it's only when the instructor activates the approach by consuming and acting on student responses that the course positively changes. The results there have been so dramatic that while the chem authors don't want to mimic it, they have a healthy degree of envy.)

So I would like to discuss how to build a basic structure and a product involving the following five somewhat aspects:

1. Concept map and linear TOC navigation

2. Problems-based (or homework/quizzing-based, in our PX categorical terminology) learning method

3. Metadata-driven connections between material

4. Animated, interactive tutorials where student activity is captured

- Q: Need to identify various types of activities unique to EGAD.

- And while the authors aren't totally on board with it, we really like aspects of Writer's Help

(Also, I think the authors want a collaborative, peer-instruction/JITT aspect, but we haven't landed there yet.)

We are good with authoring text-based content into the digital-first authoring tool, but that is only a quarter (at most) of what we want to do, and likely not the driving force.

Project Plan

Major Timeline:

Limited Testing in Jan 2013 – Jan 2014

Class Testing in Jan 2014 – Aug 2014

Release for Purchase Aug 2014

Major Tasks:

Create an information architecture that combines the concept map ideal with a more sequenced approach. The goal is to combine some exploration with a specificity to the instructional process. The information architecture should allow us to define the most granular content structures for the student and faculty member and the relationships between those concepts. It should allow for self navigation and reorganization by the faculty member as is congruent with the instructional goals of the content. This information architecture should allow us to correctly identify the level of granularity that is going to be acceptable consumption for the student and faculty member.

Create a wireframes for engaging the information architecture effectively.

Major user stories include:

• Student engaging the concept map creatively and without faculty engagement.

• Faculty Member assigning areas of the concept map to a logical structure.

• Faculty Member inserting new content into the logical structure.

• Faculty Member removing / hiding areas of the concept map based upon their outcomes.

Create wireframes for a concept player.

Major user stories include:

• Goal oriented instructional design template for concepts and the content they can enjoin.

• Q: How are the goals defined in the template? How is the template structured?

• Template a student workflow through the instructional design showing when major areas of a concept are available to a student.

• AI: Define the structure of a template. See: "Curriculum Template" on page 7

• Student can return or navigate the elements of a concept.

• Student can use a variety of materials available to help solve problems.

• Student can accomplish completion of a concept by successfully resolving a certain number of problems.

• Faculty member can retrieve reports on student performance against certain concepts.
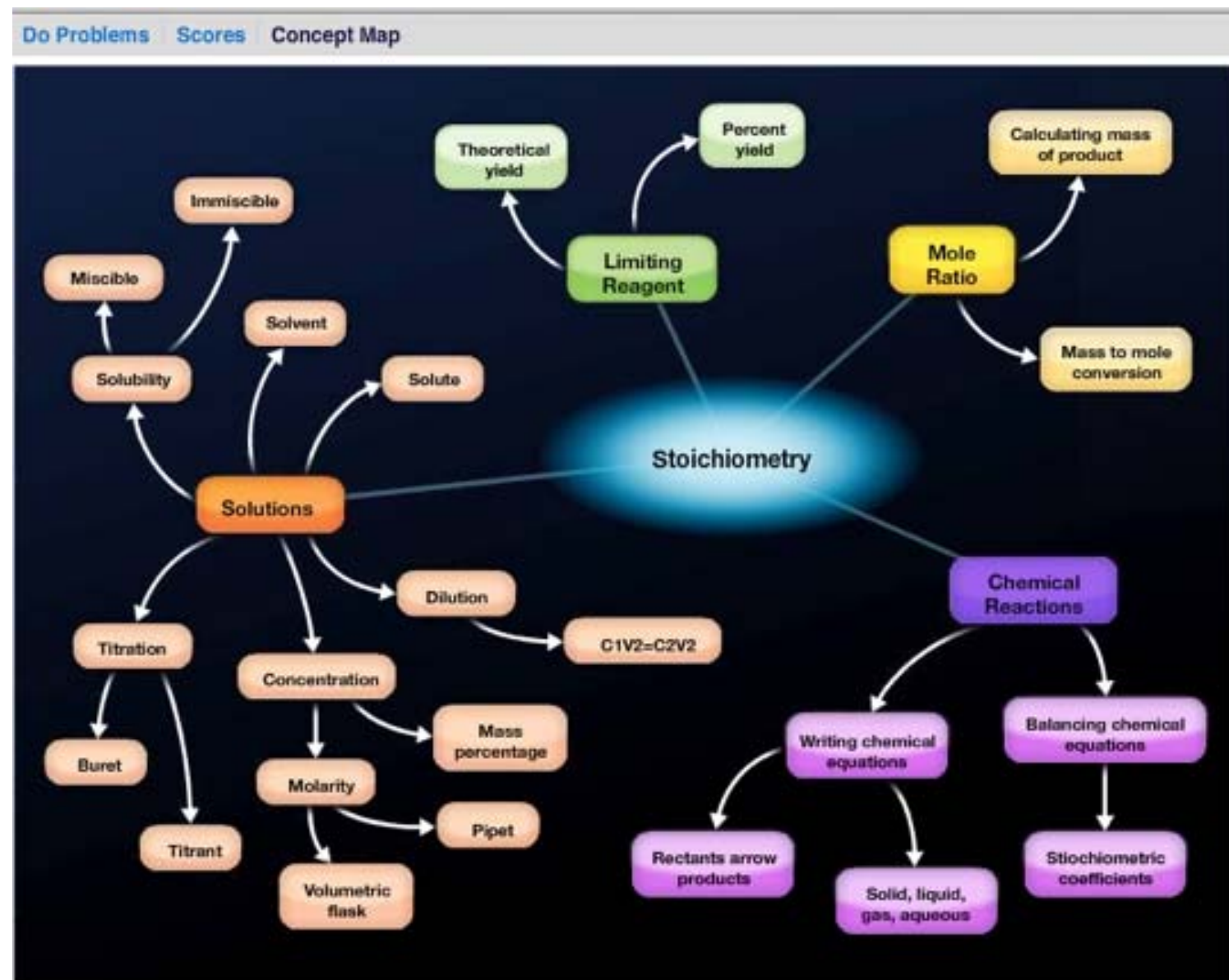
Create wireframes for a Problem Player.

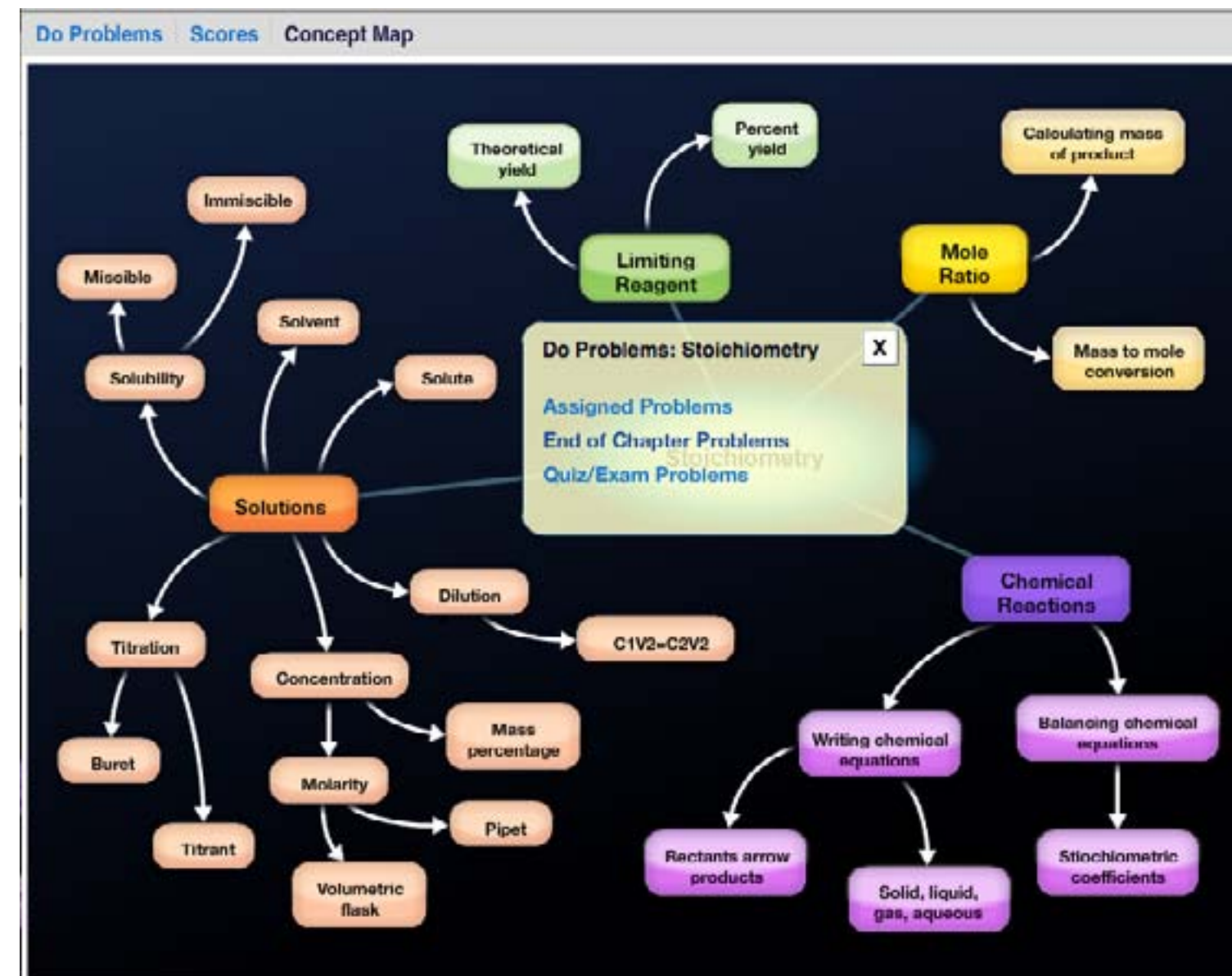Major user stories include:

• Author created high-simulation problem content types.

• Faculty can author basic problem types.

• Student can consume and submit all problem types.

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Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

8 of 22

Sample Concept Maps

Basic Map

Map on hover *(context menu)*

EGAD - The Electronic Grisham and Dwyer
Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

9 of **22**

Concept Map (Sample Hierarchy)

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Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

10 **of** **22**

Student Process Flow

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Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

11 **of** **22**
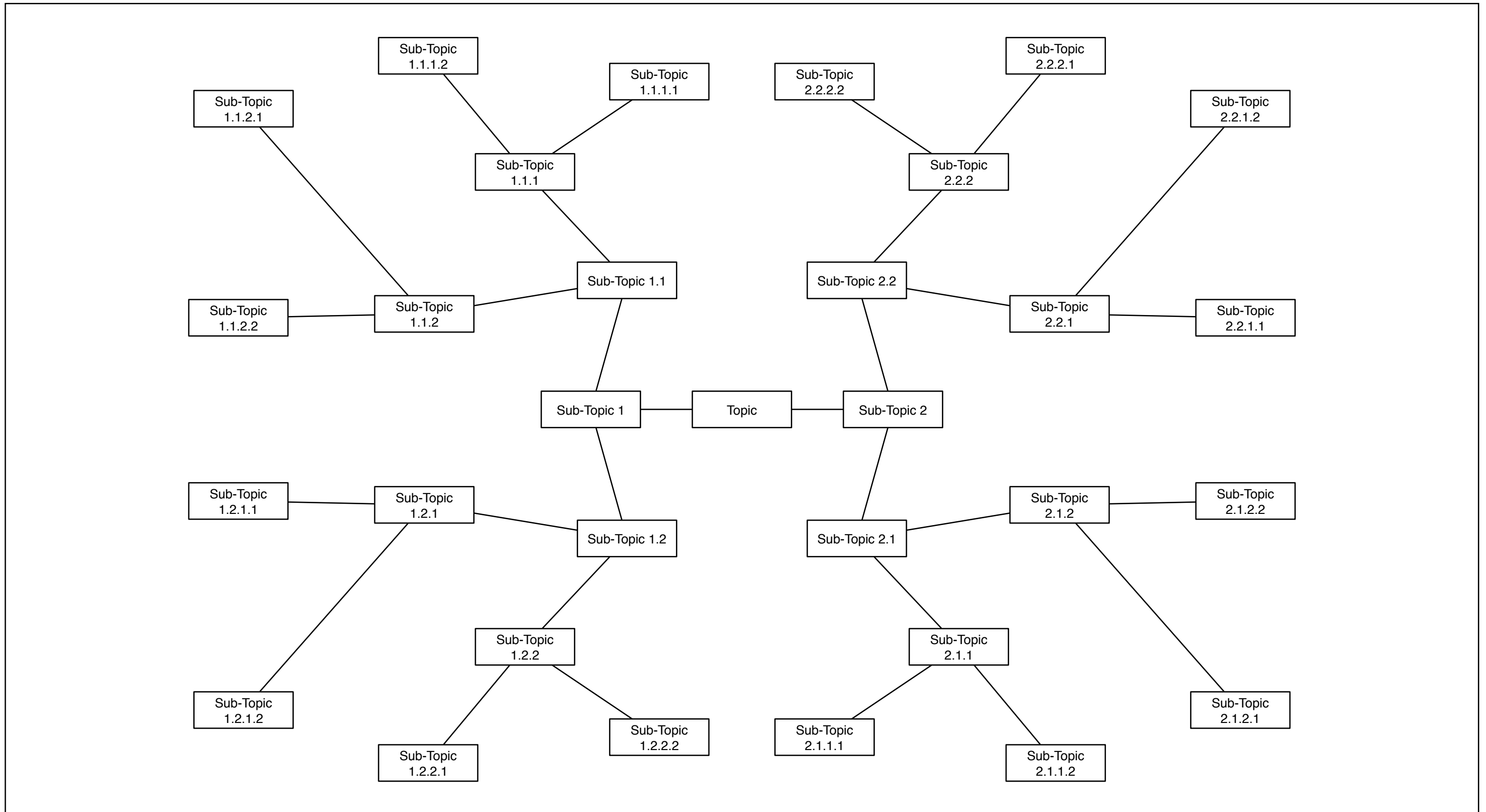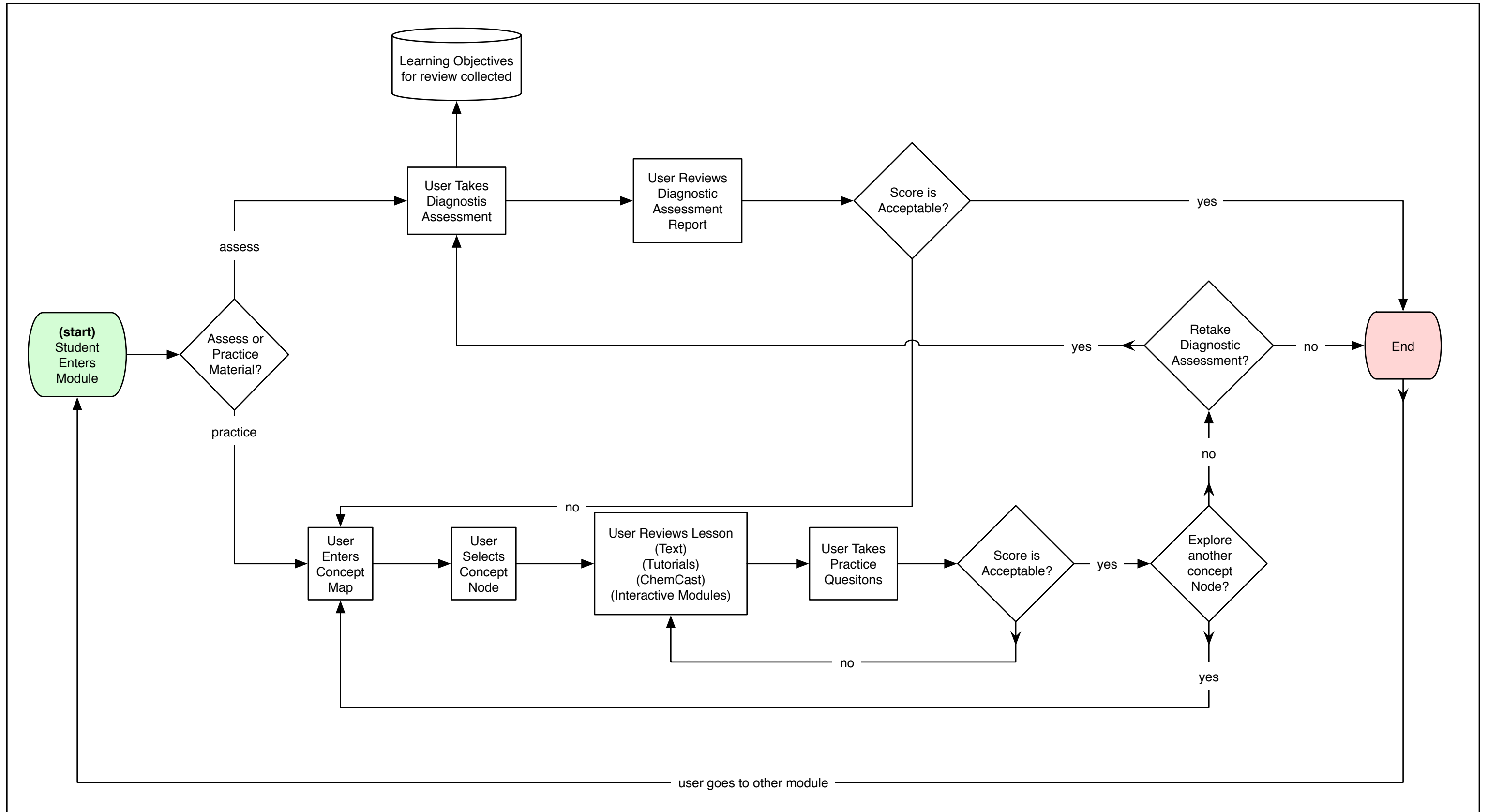
Instructor Process Flow (Learning Objective and Assessment/Item Creation)

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Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

12 of **22**

macmillan
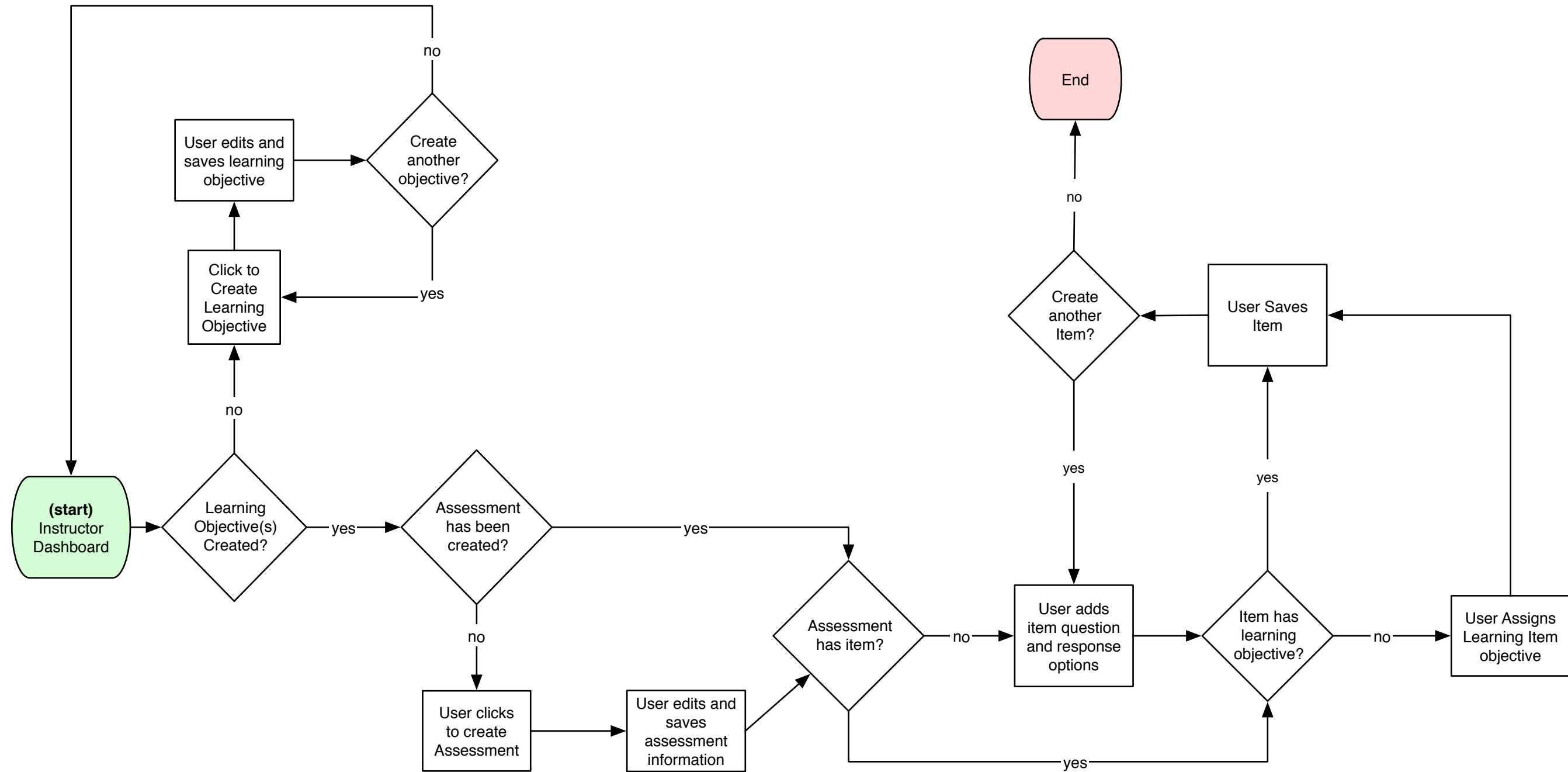
Component Information Architecture

Initial Assessment Components

| Diagnostic Quiz |
| Practice Exam |
| Homework Assignment |
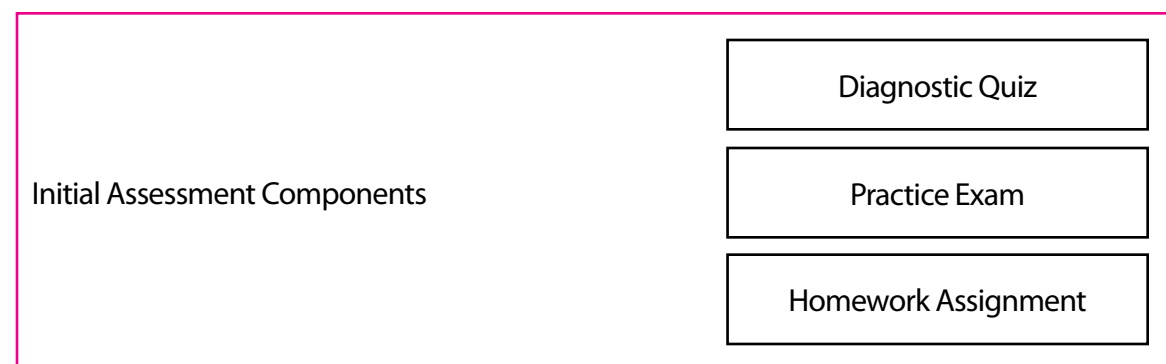
Artifact: Diagnostic Quiz, Homework or Assignment

Title <string>

question(s) *composed of*

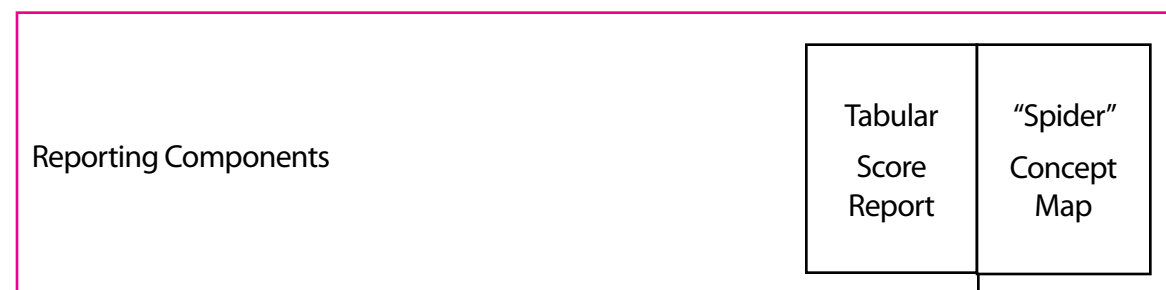Stem <string>

responses (n) <string>

concept keywords <string array>

other data will depend upon the sytem used to author the questions.

Assessment components will need to be auto-gradded format like multiple choice or true false.

Reporting Components

| Tabular Score Report | "Spider" Concept Map |

Each question is flagged with concept keywords. If a question is missed, the system matches keywords in the questions with keywords in the concept map node.

Concept Map Node
Improvement Components

| Text |
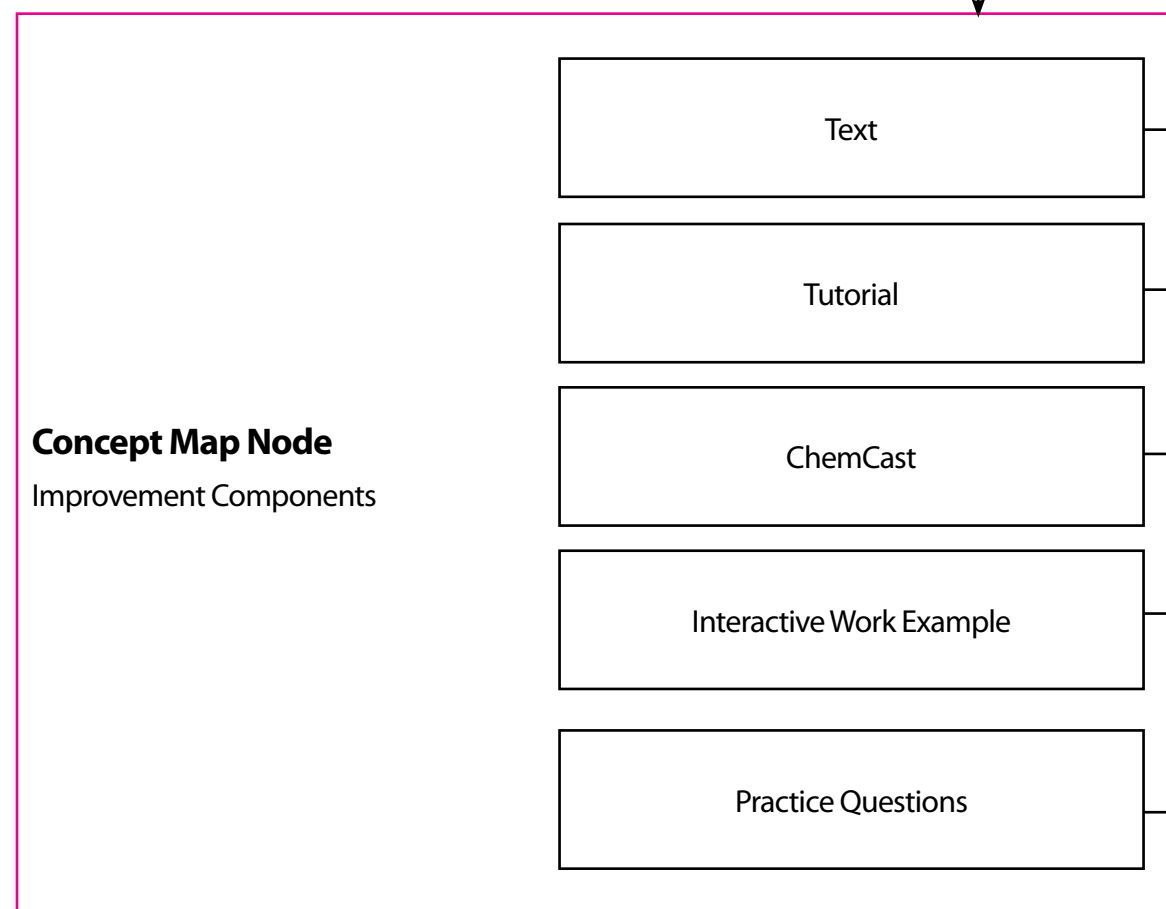
Title <string>

Content: <string> with embedded media.

| Tutorial |

Title <string>

Content: <media> *video (swf, flv, .mov, m4v, etc)*

| ChemCast |

Title <string>

Content: <media> *video (swf, flv, .mov, m4v, etc)*

What is the difference between these two?

| Interactive Work Example |

Title <string>

Content: <tbd>

because this has a set of questions IA is not able to be complete.

Another issue is to identify where the questions in the concept node are located. In some previous materials they seems to be embedded in the tutorial section, but we also have practice questions at the end. Which are tracked and reported upon?

| Practice Questions |

Multiple choice questions will be paired with the other resources in the concept node.

question(s) *composed of*

Stem <string>

responses (n) <string>

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Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

13 of **22**

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Student - Practice Exam (Start)

ChemClass: Chemistry 101
Instructor: Charles Grisham

| HOME | COURSE MATERIALS | ASSIGNMENTS |

Search | student name ▼ | Sign out | ?

Syllabus

Week 1

Week 2

Week 3

Week 4

▤ Practice Exam ①

📖 Chemical Reactivity I: Stoichiometry

▼ 4.1 What are chemical reactions?
  ▶ 4.1.1 Writing chemical reaction equations.
  ▶ 4.1.2 Balancing chemical reaction equations.
  ▶ 4.1.3 Stoichiometry: quantitative aspects of chemical reaction equations

▼ 4.2 How much product can be mode in a chemical reaction
  ▶ 4.2.1 Calculating the limiting reagent
  ▶ 4.2.2 Percent yield: actual yield vs theoretical yield

▼ 4.3 What are solutions?
  ▶ 4.3.1 Solutes, solvents, and solubility
  ▶ 4.3.2 Concentration: mass percentage and molarity
  ▶ 4.3.3 Dilutions
  ▶ 4.3.4 Solution stoichiometry
  ▶ 4.3.5 Titrations

| View | More Resources |

Exam Title

This would be the description and instructions for the practice exam.

Exam Policies

Each student will have 3 attempts

There is no time limit for this exam.

Students will NOT be able to save their progress and return to a question later after starting.

Students are allowed to email the instructor concerning their results

[Start the Practice Exam] ②

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Version 1 published January 25, 2012 by Robert Powers (rpowers.contractor@bfwpub.com)

14 of 22

Student - Practice Exam UI

Practice Exam Title

1) How many moles of sodium atoms correspond to 1.56×10^{21} atoms of sodium?

- ○ response 1
- ○ response 2
- ○ response 3

---

2) How many moles of Al atoms are needed to combine with 1.58 mol of O atoms to make aluminum oxide, Al_2O_3?

- ○ response 1
- ○ response 2
- ○ response 3

---

3) How many moles of Al are in 2.16 mol of Al_2O_3?

- ○ response 1
- ○ response 2
- ○ response 3

Time remaining: 30 minutes

Directions | < | 1 of 3 | > | Submit

Notes

tba

EGAD - The Electronic Grisham and Dwyer
Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

15 of **22**

Student - Practice Exam UI

Notes

tba

Practice Exam Title

✓ **Great!**
  You've completed the quiz! You scored an overall grade of 75%

✓ 1) How many moles of sodium atoms correspond to 1.56×10^{21} atoms of sodium?

✓ ⦿ response 1

  ◯ response 2

  ◯ response 3

✗ 2) How many moles of Al atoms are needed to combine with 1.58 mol of O atoms to make aluminum oxide, Al_2O_3?

  ◯ response 1

✗ ⦿ response 2

✓ ◯ response 3

✓ 3) How many moles of Al are in 2.16 mol of Al_2O_3?

  ◯ response 1

  ◯ response 2

✓ ⦿ response 3

Time remaining: 30 minutes

[Done]

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Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

16 of **22**

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Student - Practice Exam (Summary)

ChemClass: Chemistry 101
Instructor: Charles Grisham

Search | student name ▼ | Sign out | ?

| HOME | COURSE MATERIALS | ASSIGNMENTS |

Syllabus

Week 1

Week 2

Week 3

Week 4

📄 Practice Exam

📖 Chemical Reactivity I: Stoichiometry

▼ 4.1 What are chemical reactions?
- ▶ 4.1.1 Writing chemical reaction equations.
- ▶ 4.1.2 Balancing chemical reaction equations.
- ▶ 4.1.3 Stoichiometry: quantitative aspects of chemical reaction equations

▼ 4.2 How much product can be mode in a chemical reaction
- ▶ 4.2.1 Calculating the limiting reagent
- ▶ 4.2.2 Percent yield: actual yield vs theoretical yield

▼ 4.3 What are solutions?
- ▶ 4.3.1 Solutes, solvents, and solubility
- ▶ 4.3.2 Concentration: mass percentage and molarity
- ▶ 4.3.3 Dilutions
- ▶ 4.3.4 Solution stoichiometry
- ▶ 4.3.5 Titrations

| View | More Resources |

Exam Title

This would be the description and instructions for the practice exam.

Exam Policies

Each student will have 3 attempts

There is no time limit for this exam.

Students will NOT be able to save their progress and return to a question later after starting.

Students are allowed to email the instructor concerning their results

Attempt

1 - Jan 02, 2011 ▼

(1)

Practice Exam Results

Points Awarded	56
Points Missed	13
Percentage	81%
Time Taken	1h 35m 04sec

View Submission

[Re-take Exam]

(2)

[Open Concept Map View]

(3)

> The resources listing below indicates how your performance on this weeks practice exam relates to each units resources.
>
> For example if you scored poorly on an exam question related with a learning objective of "balancing equations", then resources below that relate to balancing equations will be highlighted for you to practice.

Summary of Review Resources

Unit	Resources
(–) 4.1 What are chemical reactions?	3 of 5
📁 resource title 1	
📁 resource title 2	
📁 resource title 3 **(5)**	
(+) 4.1.1 Writing chemical reaction equations.	0 of 2
(+) 4.1.2 Balancing chemical reaction equations.	2of 4
(+) 4.1.3 Stoichiometry: quantitative aspects of chemical reaction equations	4 of 5
(+) 4.2 How much product can be mode in a chemical reaction	0 of 6
(+) 4.2.1 Calculating the limiting reagent	0 of 3
(+) 4.2.2 Percent yield: actual yield vs theoretical yield	5 of 6
(+) 4.3 What are solutions?	0 of 7
(+) 4.3.1 Solutes, solvents, and solubility	0 of 3

(4) ?

Notes

After taking the exam the user is presented with summary information.

1. The system will display the number of attempts takes and general quantitative information about the exam.

2. The user may retake the exam as allowed by the instructor.

3. The user may open the Summary in an alternate spider map view to see areas needing review.

4. The user may hover over the ? icon to get information on the unit score.

5. Each unit will display resources requiring review.

Note: An issue here is to identify how to display items as they are reviewed to indicate that the student has already viewed the item.

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Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

17 **of** **22**

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Student - View Unit resources

ChemClass: Chemistry 101
Instructor: Charles Grisham

[Search] [student name ▼] Sign out | ?

| HOME | COURSE MATERIALS | ASSIGNMENTS |

Syllabus

Week 1

Week 2

Week 3

Week 4

▤ Practice Exam
📖 Chemical Reactivity I: Stoichiometry
▼ 4.1 What are chemical reactions?
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  ▶ 4.3.1 Solutes, solvents, and solubility
  ▶ 4.3.2 Concentration: mass percentage and molarity
  ▶ 4.3.3 Dilutions
  ▶ 4.3.4 Solution stoichiometry
  ▶ 4.3.5 Titrations

| View | More Resources |

4.1.1 Writing Chemical Equations

This would be the description of the section. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Aenean commodo ligula eget dolor. Aenean massa. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Donec quam felis, ultricies nec, pellentesque eu, pretium quis, sem.

Nulla consequat massa quis enim. Donec pede justo, fringilla vel, aliquet nec, vulputate eget, arcu. In enim justo, rhoncus ut, imperdiet a, venenatis vitae, justo. Nullam dictum felis eu pede mollis pretium. Integer tincidunt. Cras dapibus. Vivamus elementum semper nisi. Aenean vulputate eleifend tellus. Aenean leo ligula, porttitor eu, consequat vitae, eleifend ac, enim. Aliquam lorem ante, dapibus in, viverra quis, feugiat a,

image

Assignment Name	Due Date	Complete	Points
Assignment title 1	-		– / –
eBook			
Assignment title 2	-		– / –
Guided Solution			
Assignment title 3	-		– / –
Quiz			

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Version **1** published **January 25, 2012** by **Robert Powers** (rpowers.contractor@bfwpub.com)

18 of **22**

Student - Node View (Single)

Chemical Reactivity I: Stoichiometry » 4.1 What are chemical reactions?

1 BACK

2 ▲ ▼

Notes

This view shows a modified focus and engage window for this project. The window opens the resource in a full screen mode.

Resource

resource title here (ebook) ▼

3
resource title *(ebook)*

resource title *(guided solution)*

resource title *(video)*

4 **The learning objectives for this resource are:**

- balancing equations

- understanding chemical reactions

- writing chemical equations

5 New Window | Related Resource

1. The user can navigate back to the point of entry by clicking the back button in the top left section of the screen.

Lorem ipsum dolor sit amet, commodo ligula eget dolor. Aenean massa. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Donec quam felis, ultricies nec, pellentesque eu, pretium quis, sem. Nulla consequat massa quis enim. Donec pede justo, fringilla vel, aliquet nec, vulputate eget, arcu. In enim justo, rhoncus ut, imperdiet a, venenatis vitae, justo. Nullam dictum felis eu pede mollis pretium. Integer tincidunt. Cras dapibus. Vivamus elementum semper nisi. Aenean vulputate eleifend tellus. Aenean leo ligula, porttitor eu, consequat vitae, eleifend ac, enim. Aliquam lorem ante, dapibus in, viverra quis, feugiat a, tellus. Phasellus viverra nulla ut metus varius laoreet. Quisque rutrum. Aenean imperdiet. Etiam ultricies nisi vel augue. Curabitur ullamcorper ultricies nisi. Nam eget dui. Etiam rhoncus. Maecenas tempus, tellus eget condimentum rhoncus, sem quam semper libero, sit amet adipiscing sem neque sed ipsum. Nam quam nunc, blandit vel, luctus pulvinar, hendrerit id, lorem. Maecenas nec odio et ante tincidunt tempus. Donec vitae sapien ut libero venenatis faucibus.

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2. The user can view their currently location by the breadcrumb at the top of the screen.

3. This dropdown will list all the resoruces directly within the selected unit. The user can change between resources by selecting another resource in the listing.

4. By clicking the target icon the the user can view the target learning objectives associated with the resource.

5. The view buttons at the top right corner allow the user to open the current item in a new window, or view resources related to the current resource.

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19 of 22

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Student - Node View (Related)

BACK

Chemical Reactivity I: Stoichiometry » 4.1 What are chemical reactions?

▲ ▼

Resource resource title here ▼

New Window   Related Resource

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image

1

Resource Title here
Path » To » resource
(learning objective 1, learning objective 2)

Resource Title here
Path » To » resource
(learning objective 1, learning objective 2)
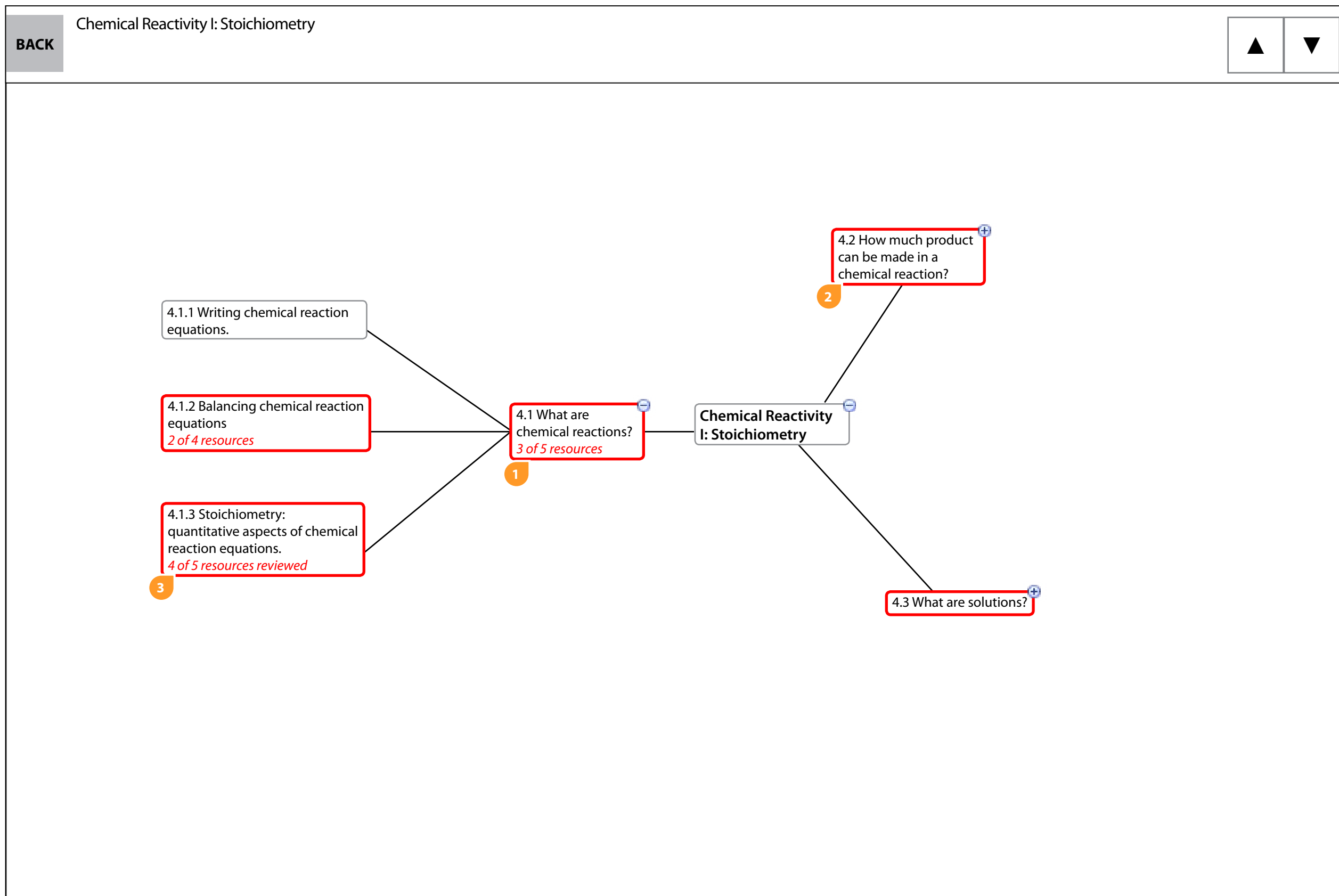
Resource Title here
Path » To » resource
(learning objective 1, learning objective 2)

Notes

By clicking on the the related button in the top right a column will open to display other resources related to the current resource.

1. Each related resource will display a title, path or location to the resource as well as the learning objectives aligned to the resource. If the user clicks on the resource, it will open in a new chromed window and using a focus and engage template it's breadcrumb will update to display its location.

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20 of **22**

Student - Spider Tree View

Chemical Reactivity I: Stoichiometry

BACK

▲ ▼

4.2 How much product can be made in a chemical reaction?

4.1.1 Writing chemical reaction equations.

4.1.2 Balancing chemical reaction equations
2 of 4 resources

4.1 What are chemical reactions?
3 of 5 resources

Chemical Reactivity I: Stoichiometry

4.1.3 Stoichiometry: quantitative aspects of chemical reaction equations.
4 of 5 resources reviewed

4.3 What are solutions?

Notes

The following view is a spider map visualization of a weeks lesson.
A user would come to this view by clicking on the (View Concept Map) button in the Practice Exam summary.

1. Each unit that containts resources to review would be shown in red and the number of resources to be reviewed would be detailed.

2. Units that have children with resources to review but not necessarily resources directly in the node would be outlined to identify them.

3. As students review the resoruces, the system will indicate how many are left to view. Once the user reviews all the reccommended resources the node style would return to a neutral state.

4. Users may collapse or expand the notes by clicking on the small circular icons at the top right of each node.

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21 of **22**

Student - Resource View with Focus Items

1 **BACK**

Chemical Reactivity I: Stoichiometry » 4.1 What are chemical reactions? » 4.1.2 Balancing chemical reaction equations.

▲ ▼

Resource   resource title here (ebook) ▼ ⊙

New Window   **Related Resource**

3
- ❗ resource title *(ebook)*
- ❗ resource title *(tutorial)*
- resource title *(guided solution)*
- resource title *(video)*

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image

Notes

This view shows a modified focus and engage window for this project. The window opens the resource in a full screen mode.

1. The user can navigate back to the point of entry by clicking the back button in the top left section of the screen.

2. The user can view their currently location by the breadcrumb at the top of the screen.

3. This dropdown will list all the resoruces directly within the selected unit. The user can change between resources by selecting another resource in the listing.

4. By clicking the target icon the the user can view the target learning objectives associated with the resource.

5. The view buttons at the top right corner allow the user to view a single resource. Compare resources or view resources related to the current resource.

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22 of **22**

Student - Practice Homework (Start)

ChemClass: Chemistry 101
Instructor: Charles Grisham

| Search | | student name ▼ | Sign out | ? |

HOME | COURSE MATERIALS | ASSIGNMENTS

Syllabus

Week 1

Week 2

Week 3

Week 4

▤ Practice Exam

📖 Chemical Reactivity I: Stoichiometry

▼ 4.1 What are chemical reactions?
- ► 4.1.1 Writing chemical reaction equations.
- ► 4.1.2 Balancing chemical reaction equations.
- ▼ 4.1.3 Stoichiometry: quantitative aspects of chemical reaction equations
  - ▤ Practice Homework

▼ 4.2 How much product can be mode in a chemical reaction
- ► 4.2.1 Calculating the limiting reagent
- ► 4.2.2 Percent yield: actual yield vs theoretical yield

▼ 4.3 What are solutions?
- ► 4.3.1 Solutes, solvents, and solubility
- ► 4.3.2 Concentration: mass percentage and molarity
- ► 4.3.3 Dilutions
- ► 4.3.4 Solution stoichiometry

View | More Resources

Homework Title

[Description] This would be the description and instructions for the practice homework.

Policies

1 Your best attempt will be counted as a grade.

There is no time limit for this assessment.

You will be able to save their progress and return to the assessment later after starting.

2 [Start Homework] *(or start the homework at a specific question by clicking "Attempt" next to any question below)*

Assessment Questions

Question Title	Attemps *(click to review)*	Points	

1) How many moles of sodium atoms correspond to 1.56x10²¹ atoms of sodium?
▼ Resources
  • Resource 1
  • Resource 2
  • Resource 3
	0/4 | 1/4 | saved
	1 attemp remains
		1/4	Resume

2) How many moles of Al atoms are needed to combine with 1.58 mol of O atoms to make aluminum oxide, Al2O3? ► Resources	– | – | – 3 attemp remains	– / –	Attempt
3) How many moles of Al are in 2.16 mol of Al2O3? ► Resources	2/4 | 3/4 | – unlimited attemps	3/4	Attempt

Note markers: 1, 2, 3 (orange circles)

Notes

This page illustrates a landing page for a homework assignment.

1. The user can read the typical homework description and policies.

2. User can open up all homework problems in a single player or attempt each one individually.

3. Each item will contain a set of resources related by learning objective alignment. If the user clicks on a resource it will open in a focus and engage window and the student may review the resource.

NOTE:
For the resource to display under the question, two requirements must be fulfilled.
1. The resource must be included somewhere within the current syllabus.
2. The resource and item must have at least one matching learning objective.