WISE and WISEngineering Connections Between NGSS Content and Practices

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Goals

- Provide technology-enhanced 3D NGSS curricular resources to help connect practices with content
- Combine curricula, assessment, teacher tools
- Engineering DCIs and practices

Can we enhance our curriculum with cyberlearning resources? **YES**

Design Challenge

- Create a school garden
- Must grow some edible plants and be student maintained
- Total space = 20′ x 20′
- Total budget = $400
- Total time = 2 weeks

What would your next steps be?

NGSS Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Making NGSS Connections

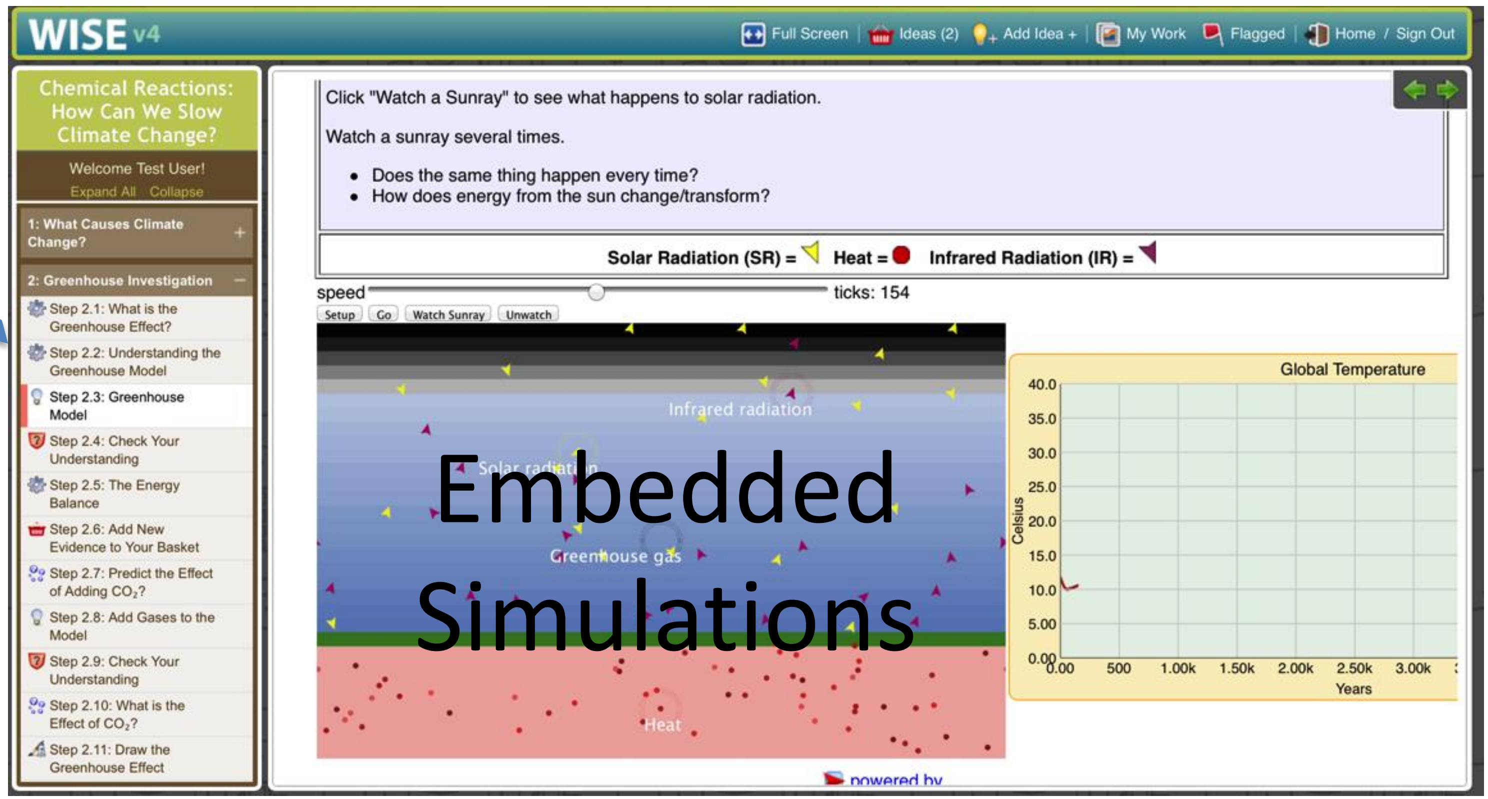
WISE: Web-based Inquiry Science Environment:

https://wise.berkeley.edu

Supporting NGSS practices

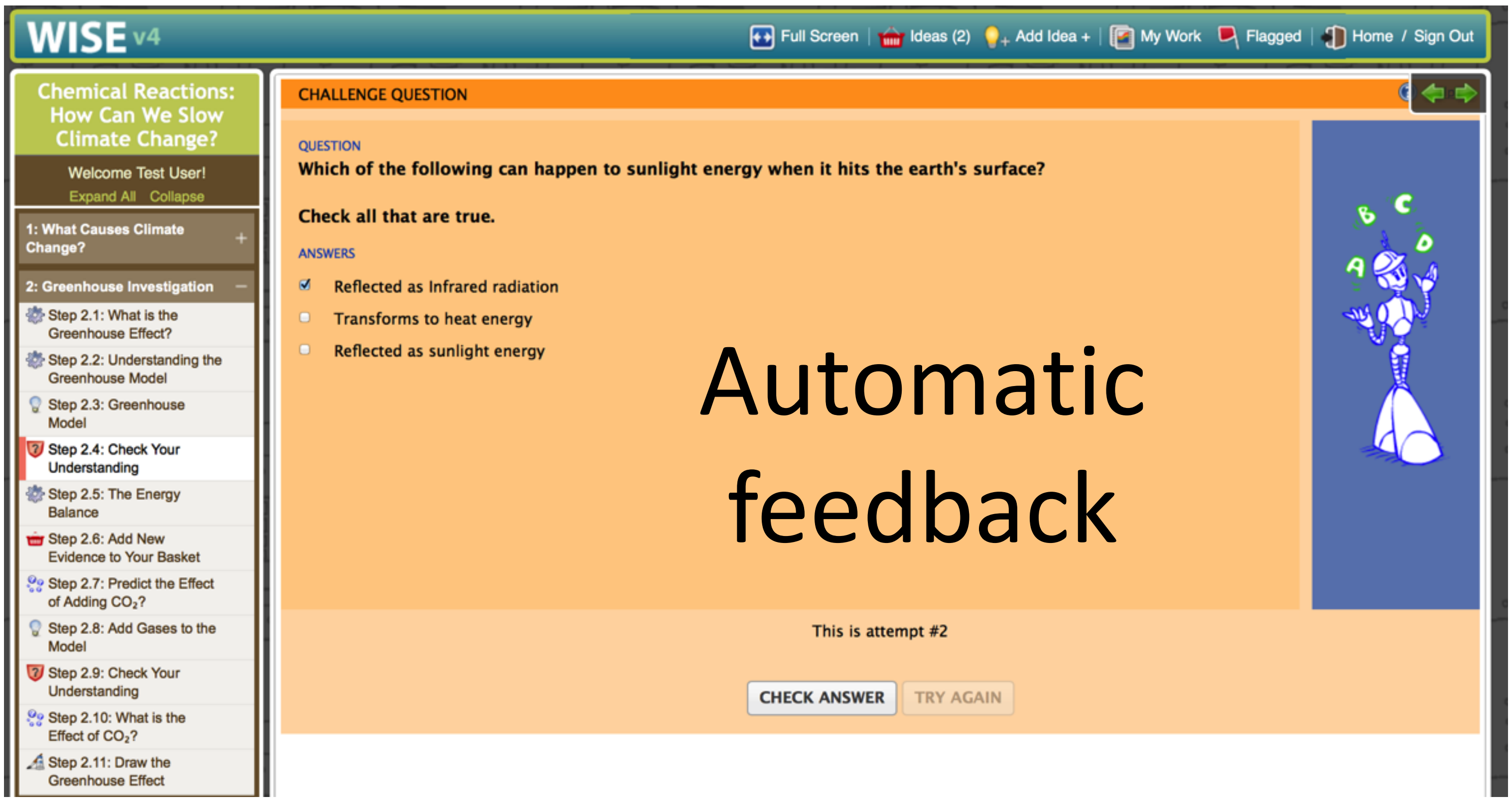
Features to support NGSS DCI's and CC's

Inquiry Map



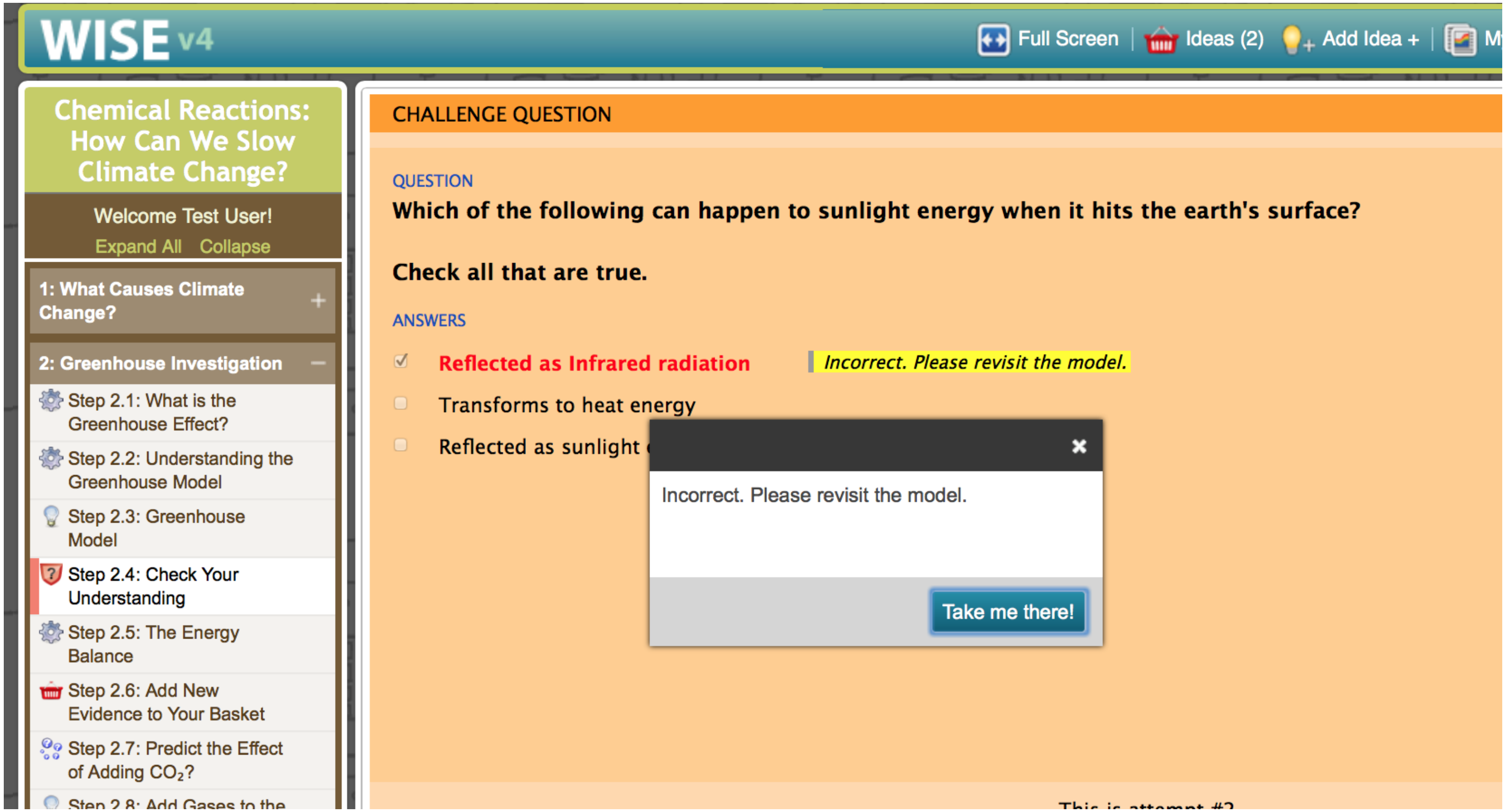
WISE

Features to support NGSS DCI's and CC's



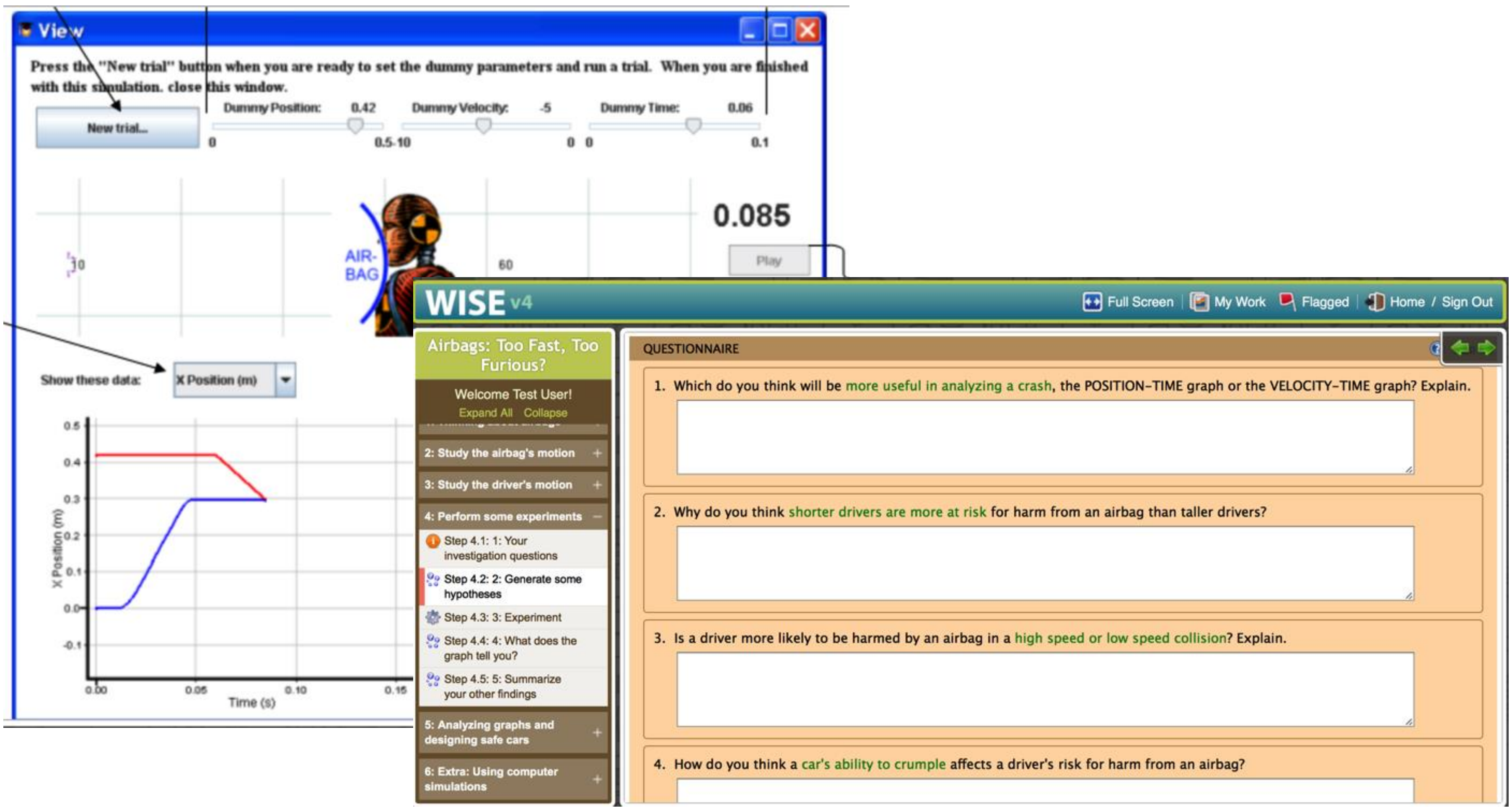
Automatic feedback

Features to support NGSS DCI’s and CC’s

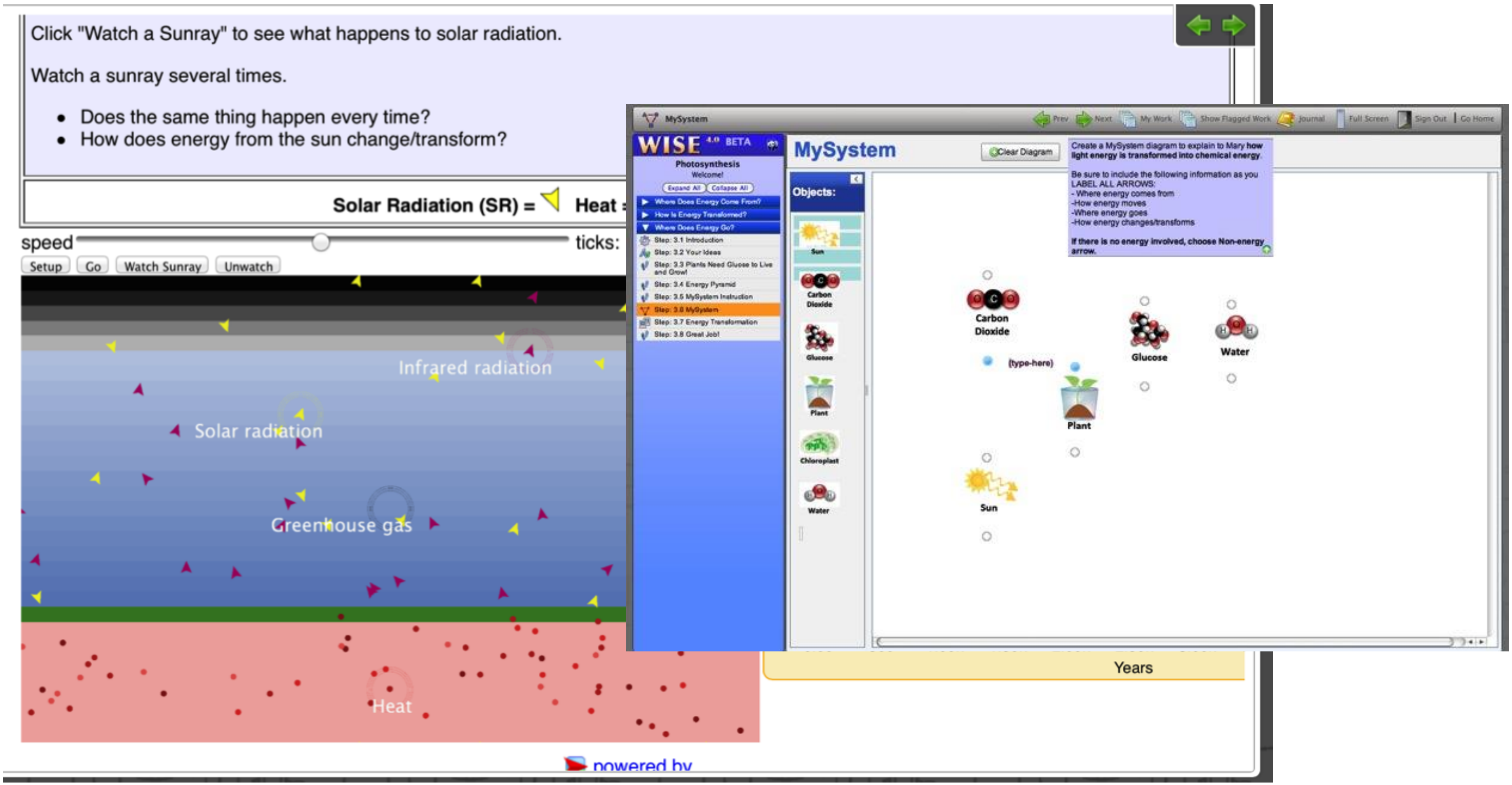


Supporting NGSS practices

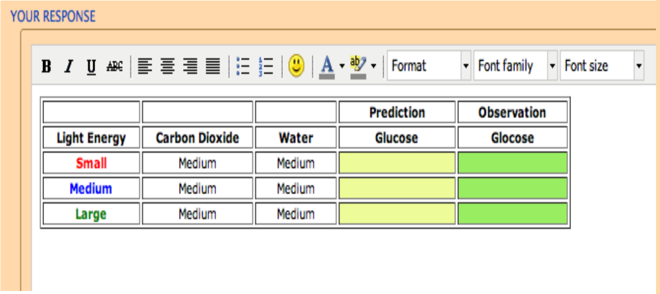
Asking questions



Developing and using models



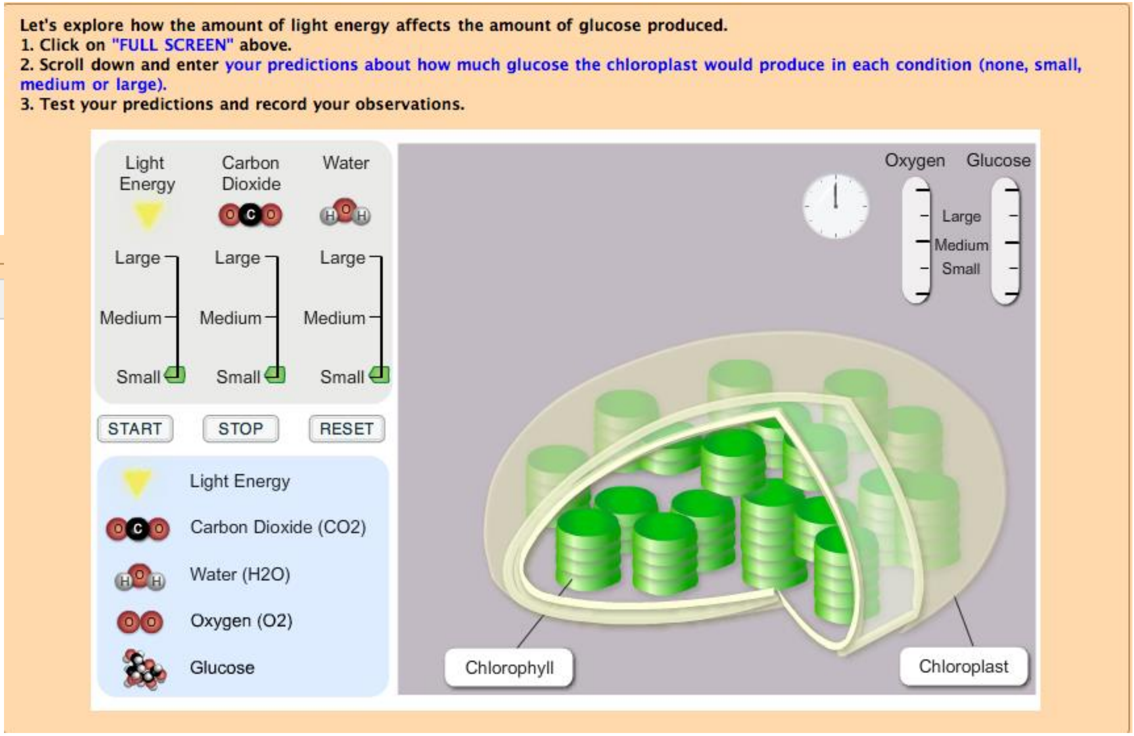
Planning and Carrying out Investigations



YOUR RESPONSE

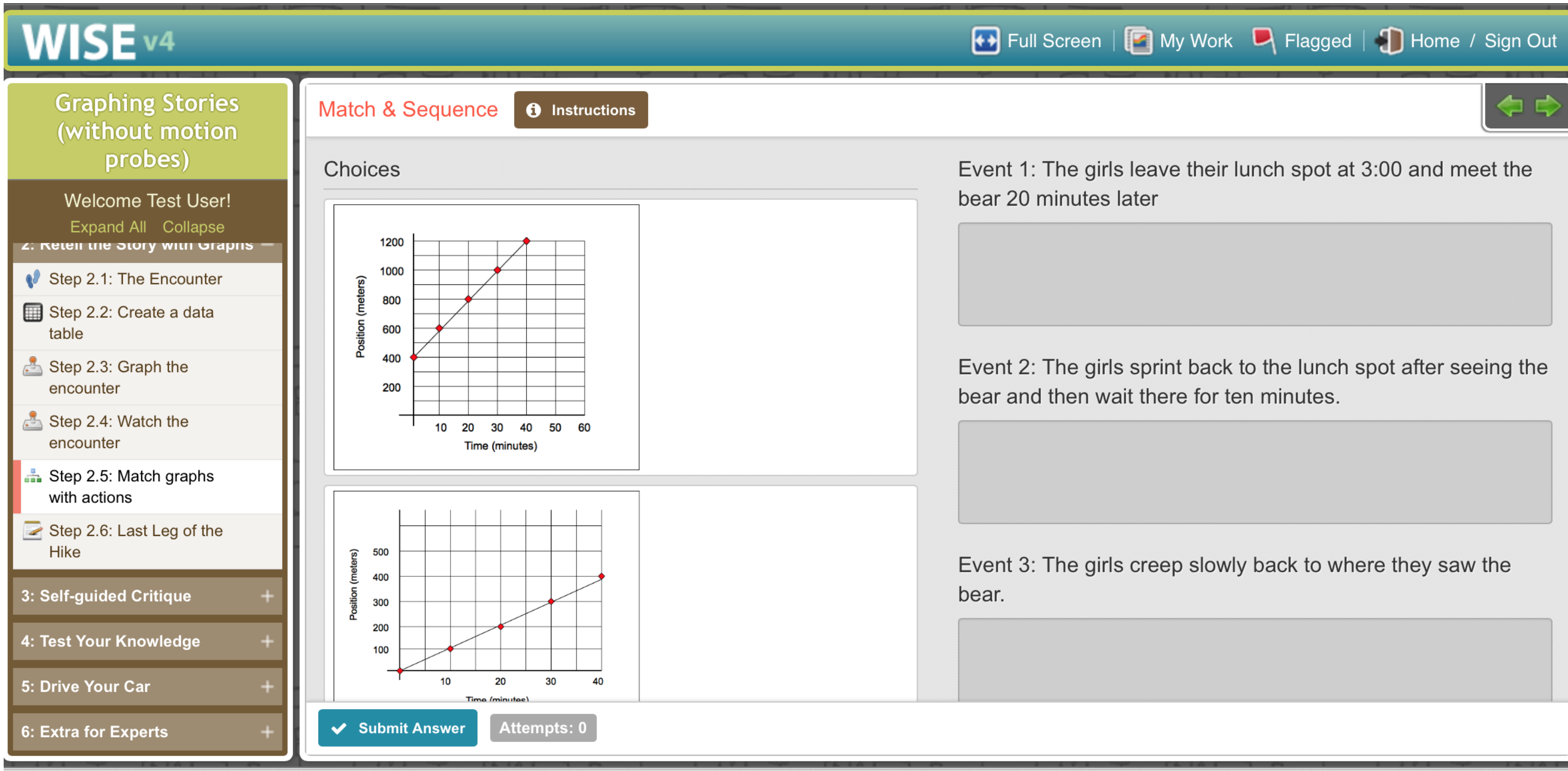
B I U ABC Format Font family Font size

			Prediction	Observation
Light Energy	Carbon Dioxide	Water	Glucose	Glocose
Small	Medium	Medium		
Medium	Medium	Medium		
Large	Medium	Medium		



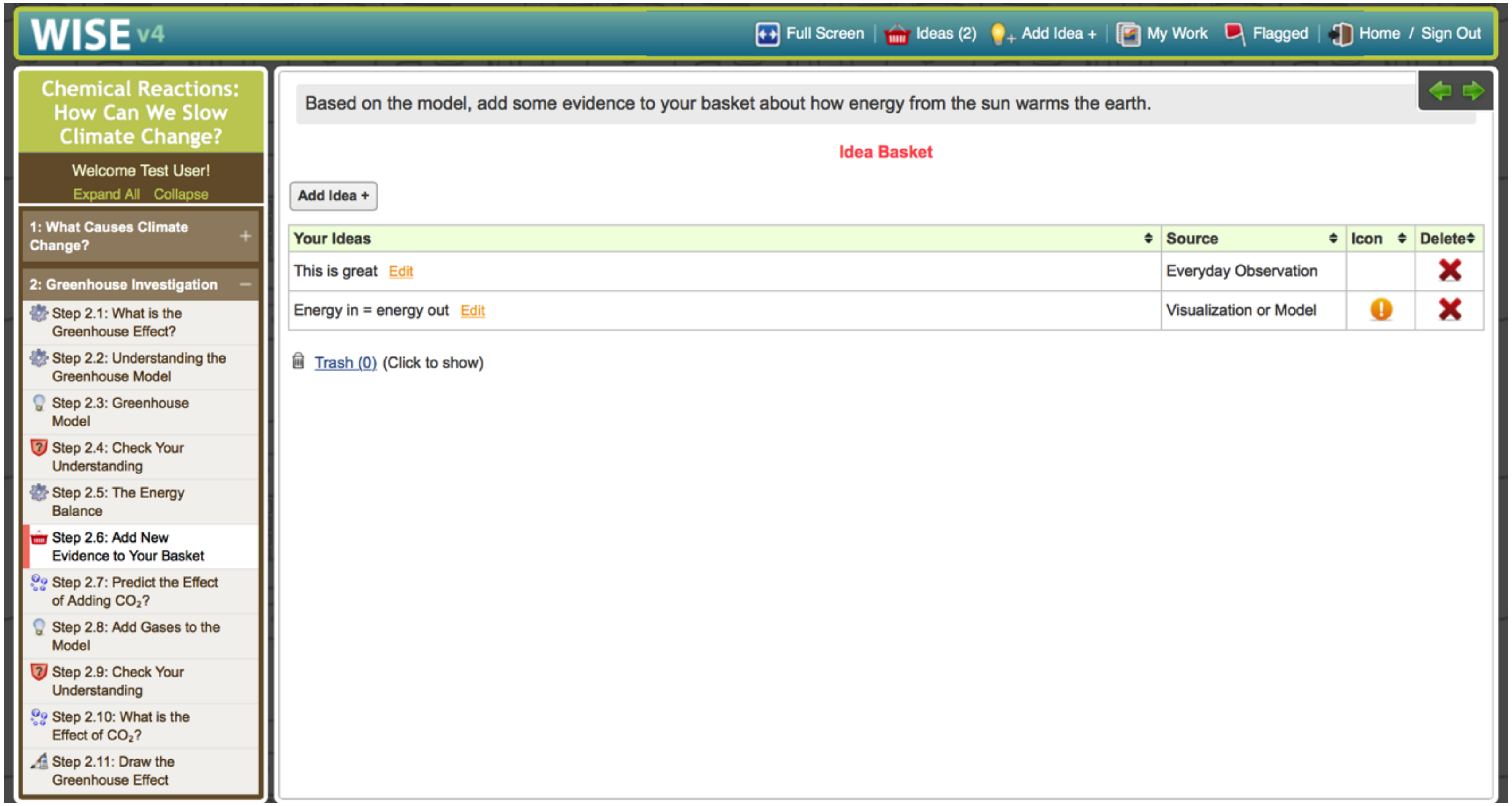
Supporting NGSS practices

Analyzing and Interpreting Data

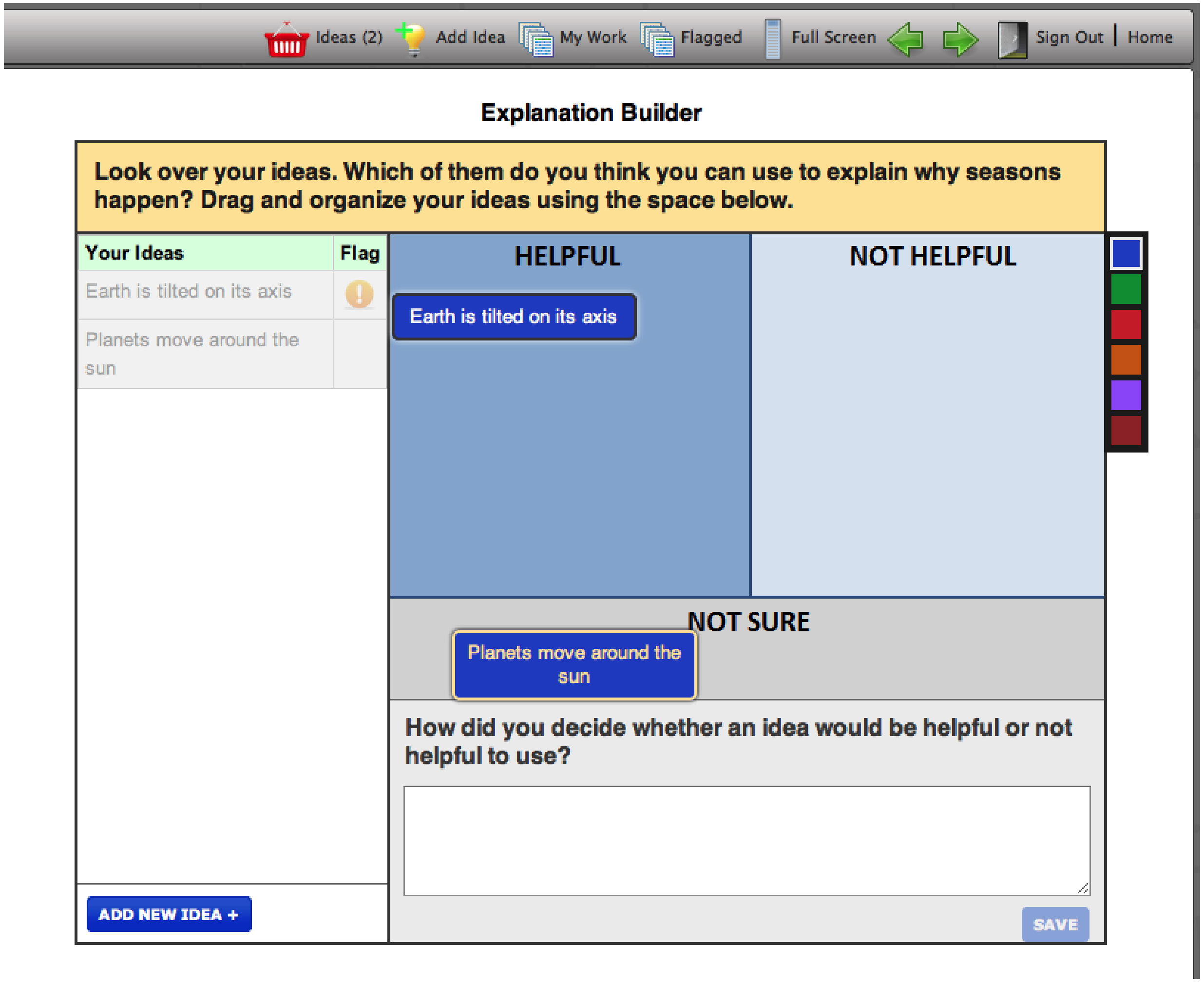


Supporting NGSS practices

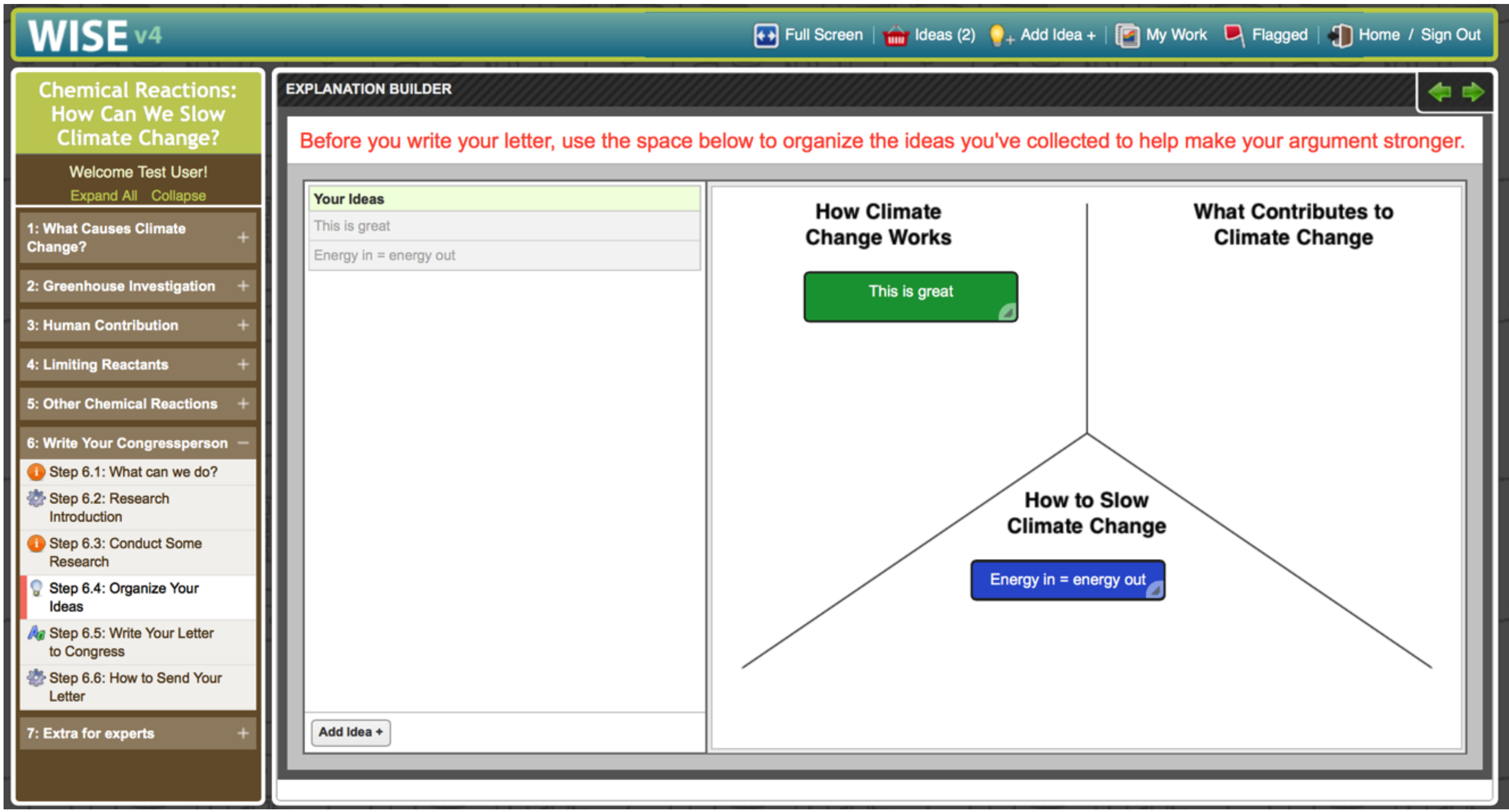
Constructing Explanations



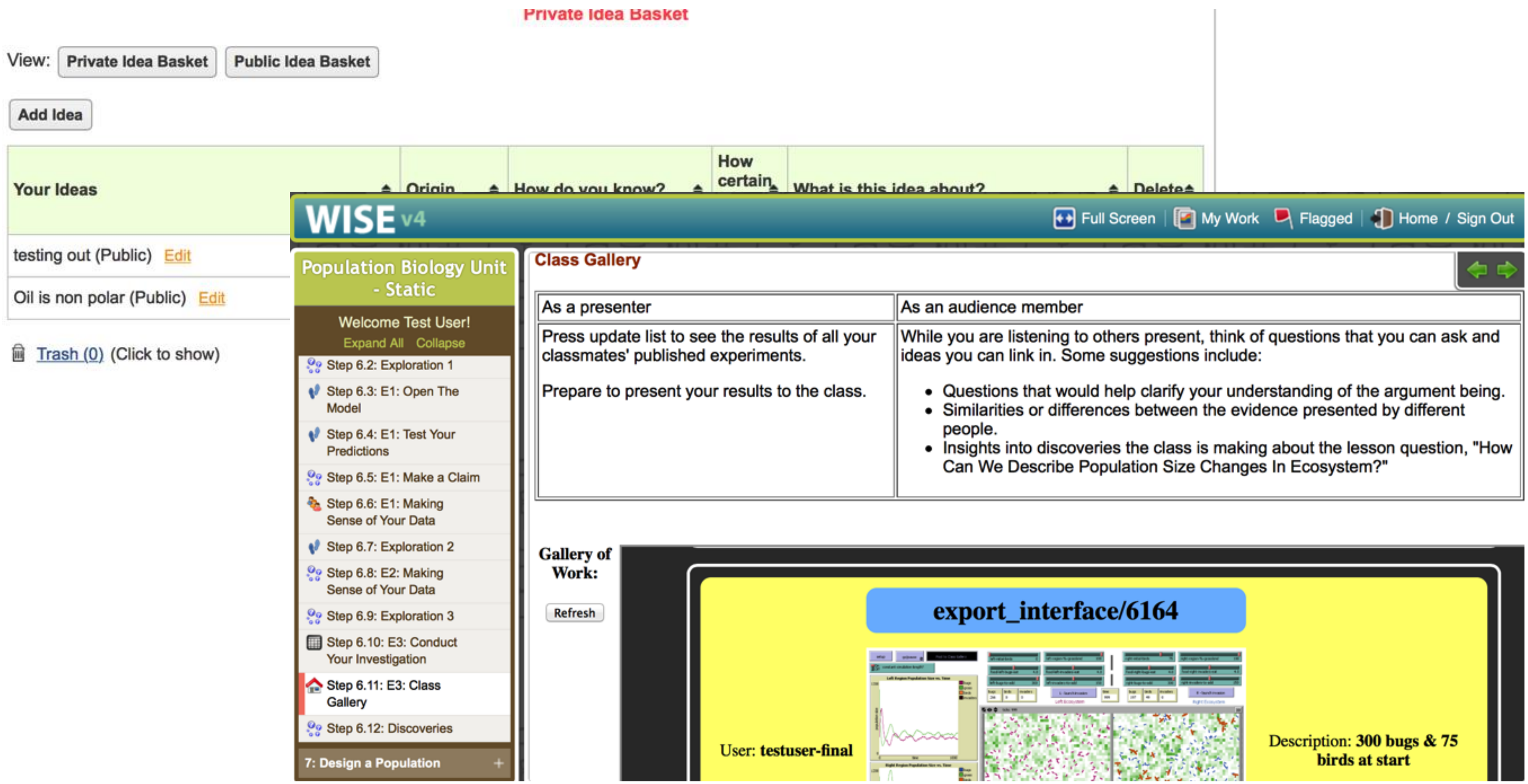
Constructing Explanations



Engaging in argument from evidence

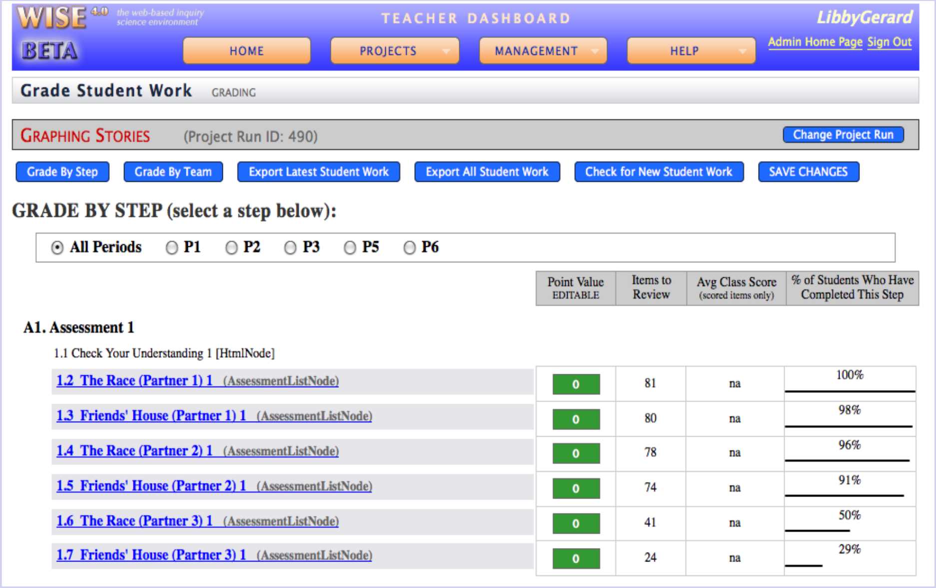


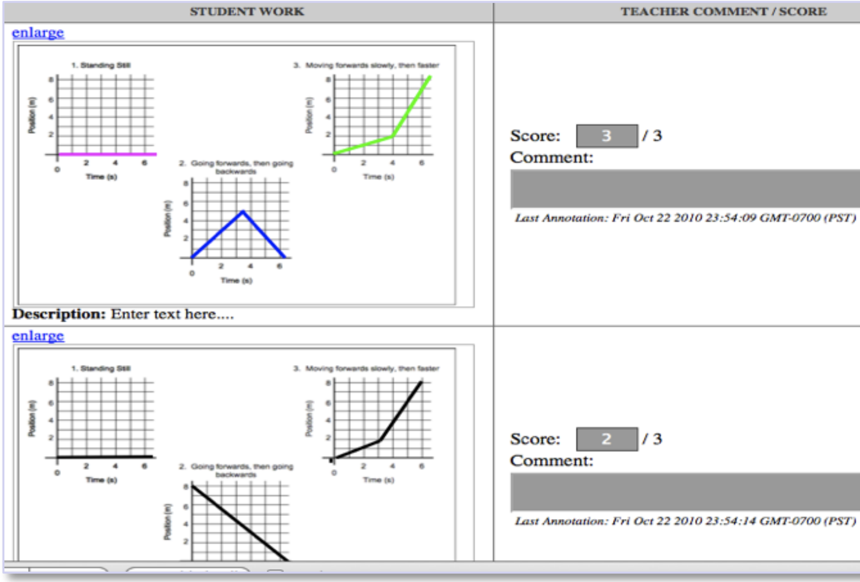
Obtaining, evaluating, communicating



Teacher Supports

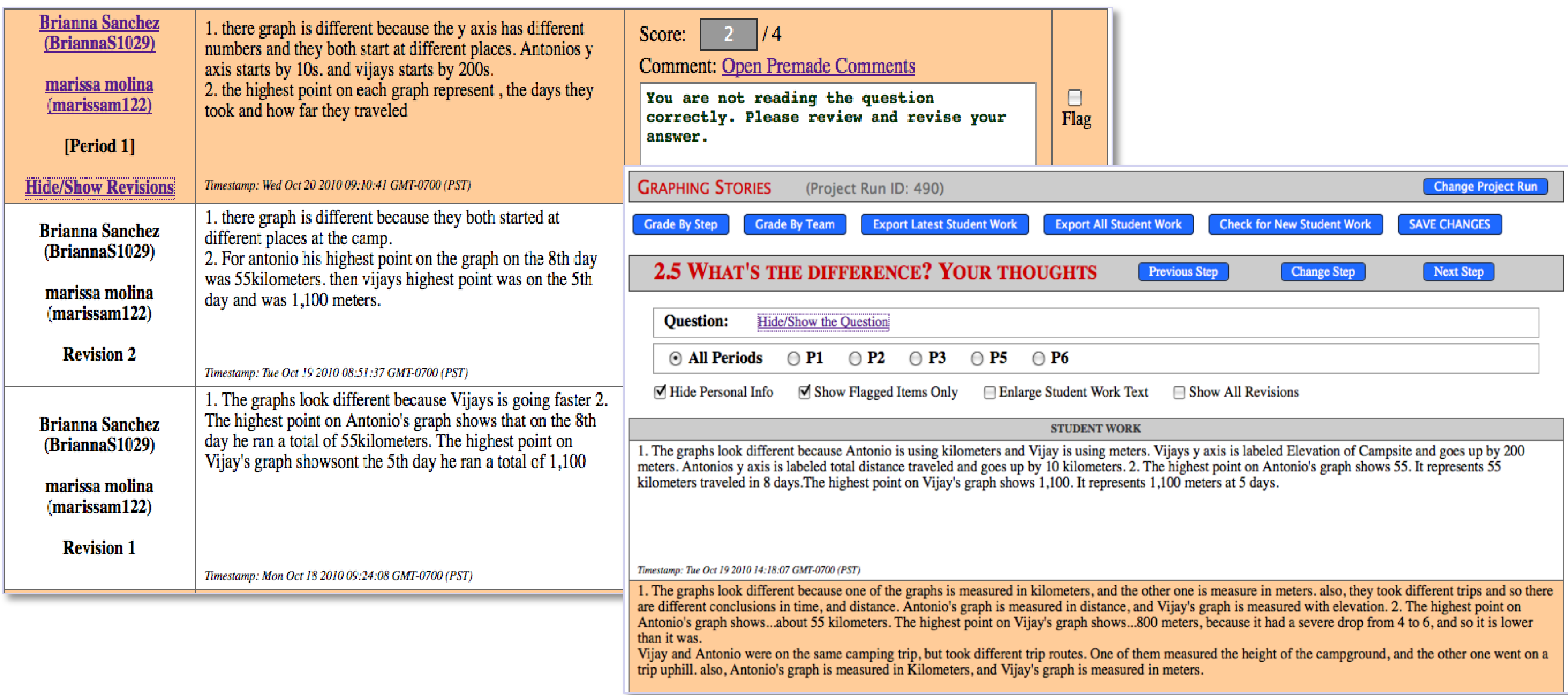
- Student Monitors/progress
- Automatic scoring of student work





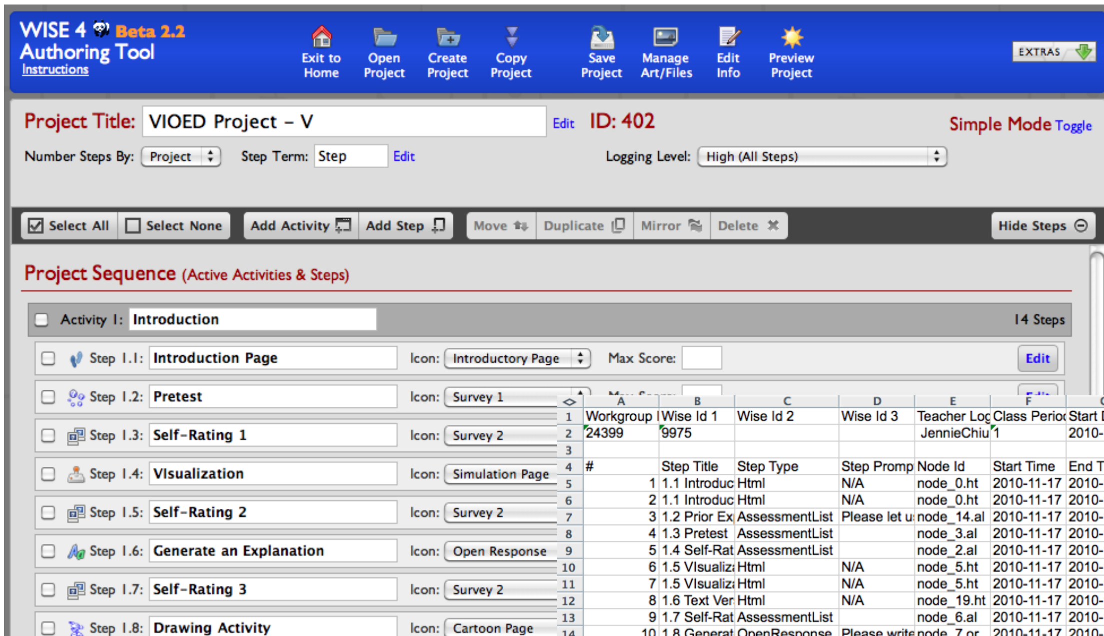
Features to support teachers

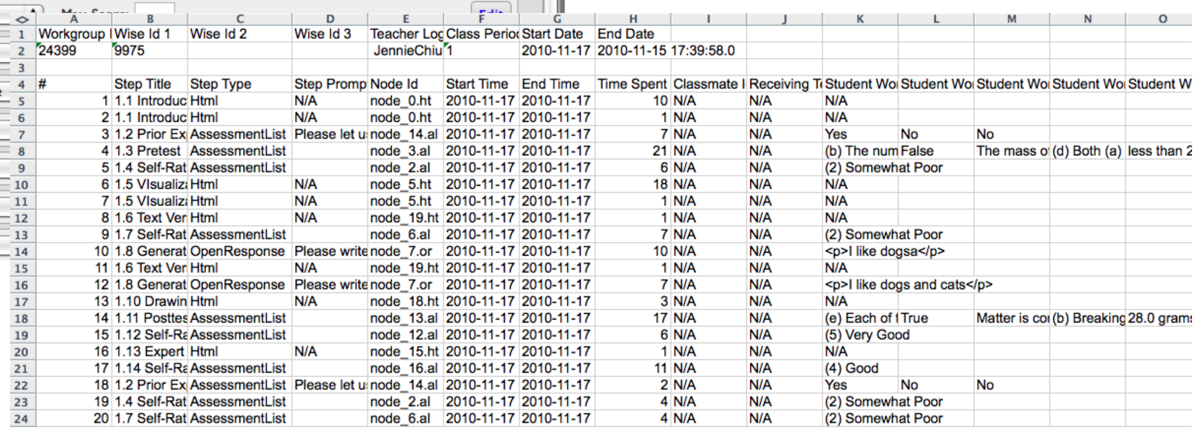
- Scoring of student work
- Feedback/displaying student work



Customization

- Authoring and research tools





	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Workgroup I	Wise Id 1	Wise Id 2	Wise Id 3	Teacher Log	Class Period	Start Date	End Date							
2	24399	9975			JennieChiu	1	2010-11-17	2010-11-15 17:39:58.0							
3															
4	#	Step Title	Step Type	Step Promp	Node Id	Start Time	End Time	Time Spent	Classmate I	Receiving T	Student Wo	Student Wo	Student Wo	Student Wo	Student W
5	1	1.1 Introduc	Html	N/A	node_0.ht	2010-11-17	2010-11-17	10	N/A	N/A	N/A				
6	2	1.1 Introduc	Html	N/A	node_0.ht	2010-11-17	2010-11-17	1	N/A	N/A	N/A				
7	3	1.2 Prior Ex	AssessmentList	Please let u	node_14.al	2010-11-17	2010-11-17	7	N/A	N/A	Yes	No	No		
8	4	1.3 Pretest	AssessmentList		node_3.al	2010-11-17	2010-11-17	21	N/A	N/A	(b) The num	False	The mass o	(d) Both (a)	less than 2
9	5	1.4 Self-Rat	AssessmentList		node_2.al	2010-11-17	2010-11-17	6	N/A	N/A	(2) Somewhat Poor				
10	6	1.5 Visualiz	Html	N/A	node_5.ht	2010-11-17	2010-11-17	18	N/A	N/A	N/A				
11	7	1.5 Visualiz	Html	N/A	node_5.ht	2010-11-17	2010-11-17	1	N/A	N/A	N/A				
12	8	1.6 Text Ver	Html	N/A	node_19.ht	2010-11-17	2010-11-17	1	N/A	N/A	N/A				
13	9	1.7 Self-Rat	AssessmentList		node_6.al	2010-11-17	2010-11-17	7	N/A	N/A	(2) Somewhat Poor				
14	10	1.8 Generat	OpenResponse	Please write	node_7.or	2010-11-17	2010-11-17	10	N/A	N/A	I like dogsa				
15	11	1.6 Text Ver	Html	N/A	node_19.ht	2010-11-17	2010-11-17	1	N/A	N/A	N/A				
16	12	1.8 Generat	OpenResponse	Please write	node_7.or	2010-11-17	2010-11-17	7	N/A	N/A	I like dogs and cats				
17	13	1.10 Drawin	Html	N/A	node_18.ht	2010-11-17	2010-11-17	3	N/A	N/A	N/A				
18	14	1.11 Posttes	AssessmentList		node_13.al	2010-11-17	2010-11-17	17	N/A	N/A	(e) Each of t	True	Matter is co	(b) Breaking	28.0 grams
19	15	1.12 Self-Ra	AssessmentList		node_12.al	2010-11-17	2010-11-17	6	N/A	N/A	(5) Very Good				
20	16	1.13 Expert	Html	N/A	node_15.ht	2010-11-17	2010-11-17	1	N/A	N/A	N/A				
21	17	1.14 Self-Ra	AssessmentList		node_16.al	2010-11-17	2010-11-17	11	N/A	N/A	(4) Good				
22	18	1.2 Prior Ex	AssessmentList	Please let u	node_14.al	2010-11-17	2010-11-17	2	N/A	N/A	Yes	No	No		
23	19	1.4 Self-Rat	AssessmentList		node_2.al	2010-11-17	2010-11-17	4	N/A	N/A	(2) Somewhat Poor				
24	20	1.7 Self-Rat	AssessmentList		node_6.al	2010-11-17	2010-11-17	4	N/A	N/A	(2) Somewhat Poor				

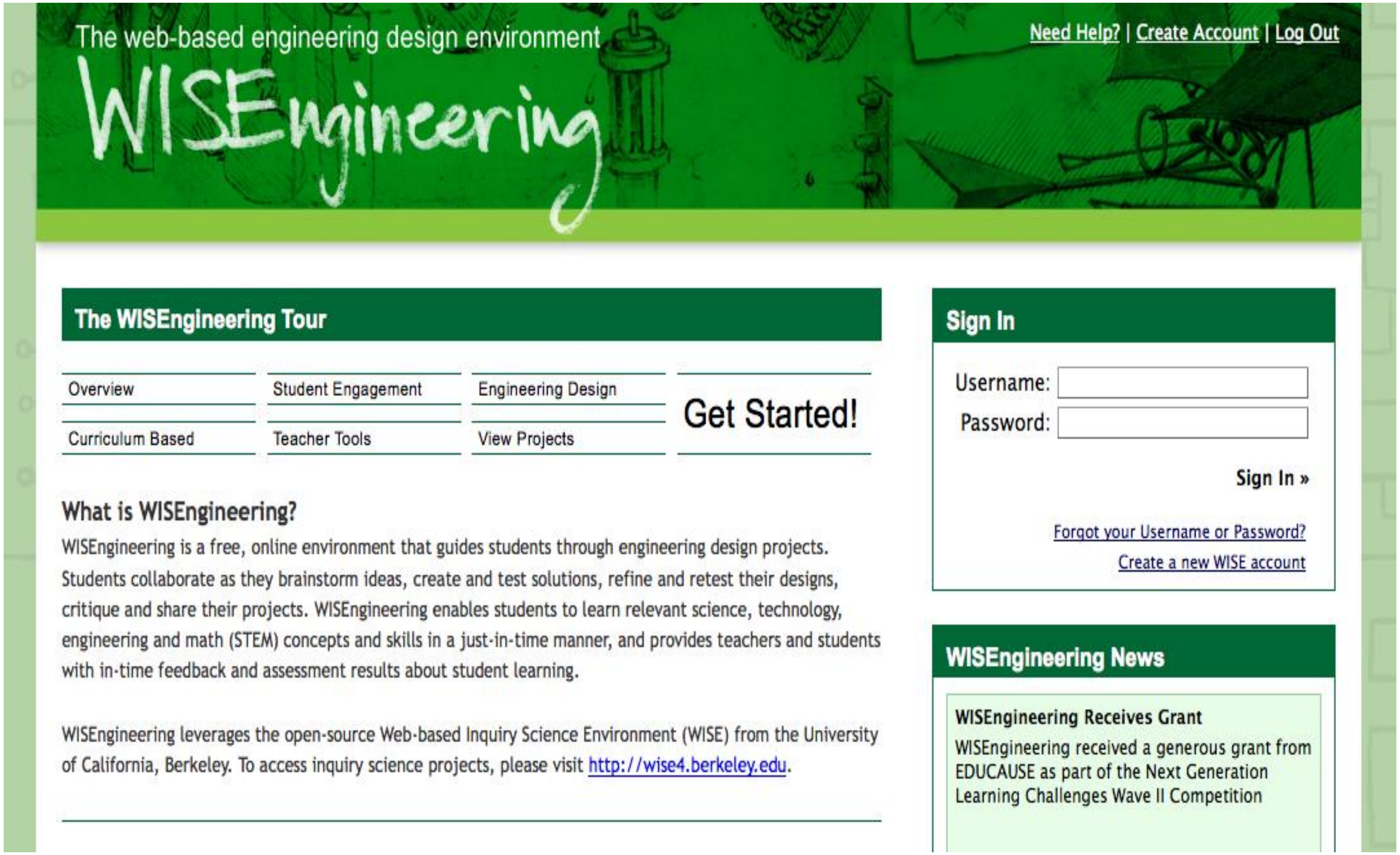
Wait…

- Defining problems, designing solutions?

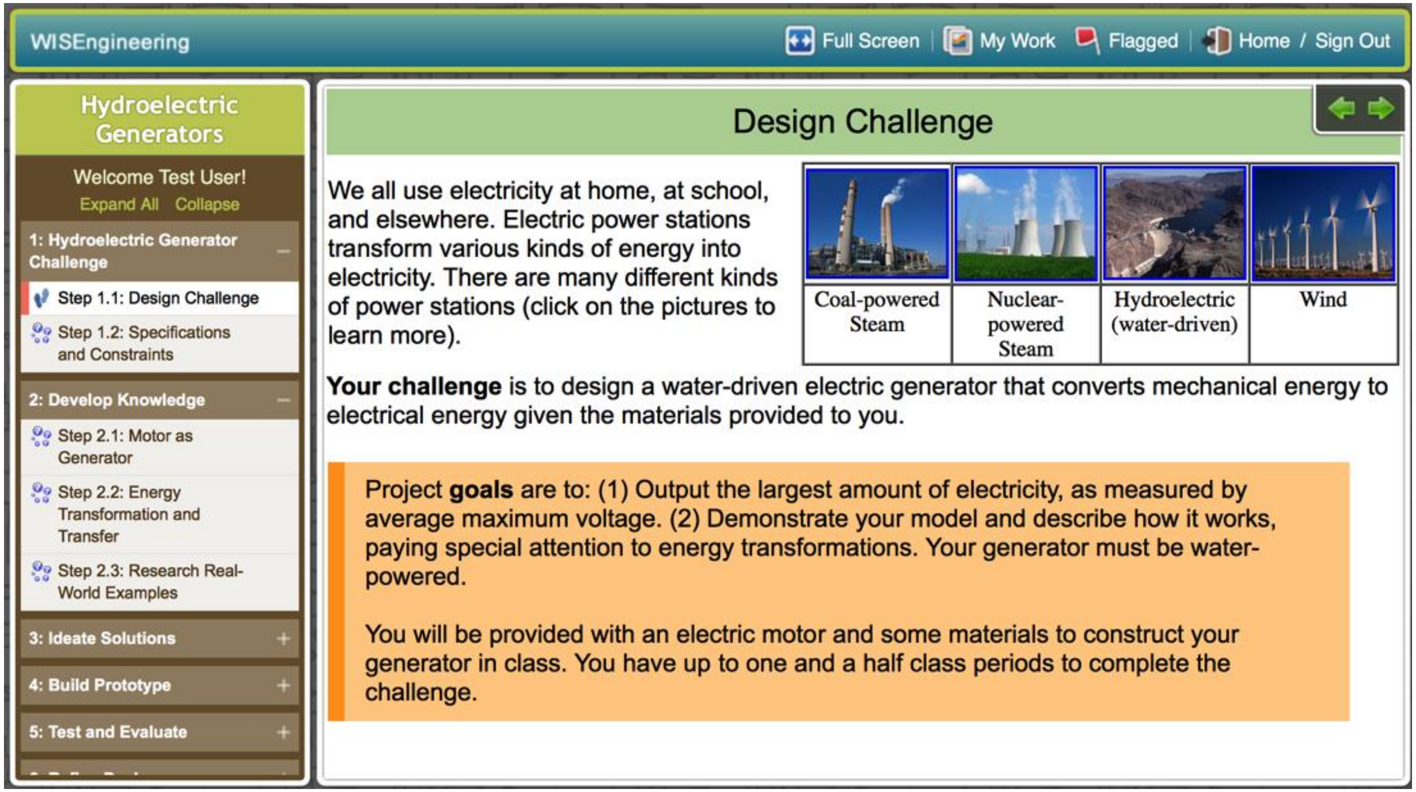
- NGSS means also teaching engineering!

WISEngineering

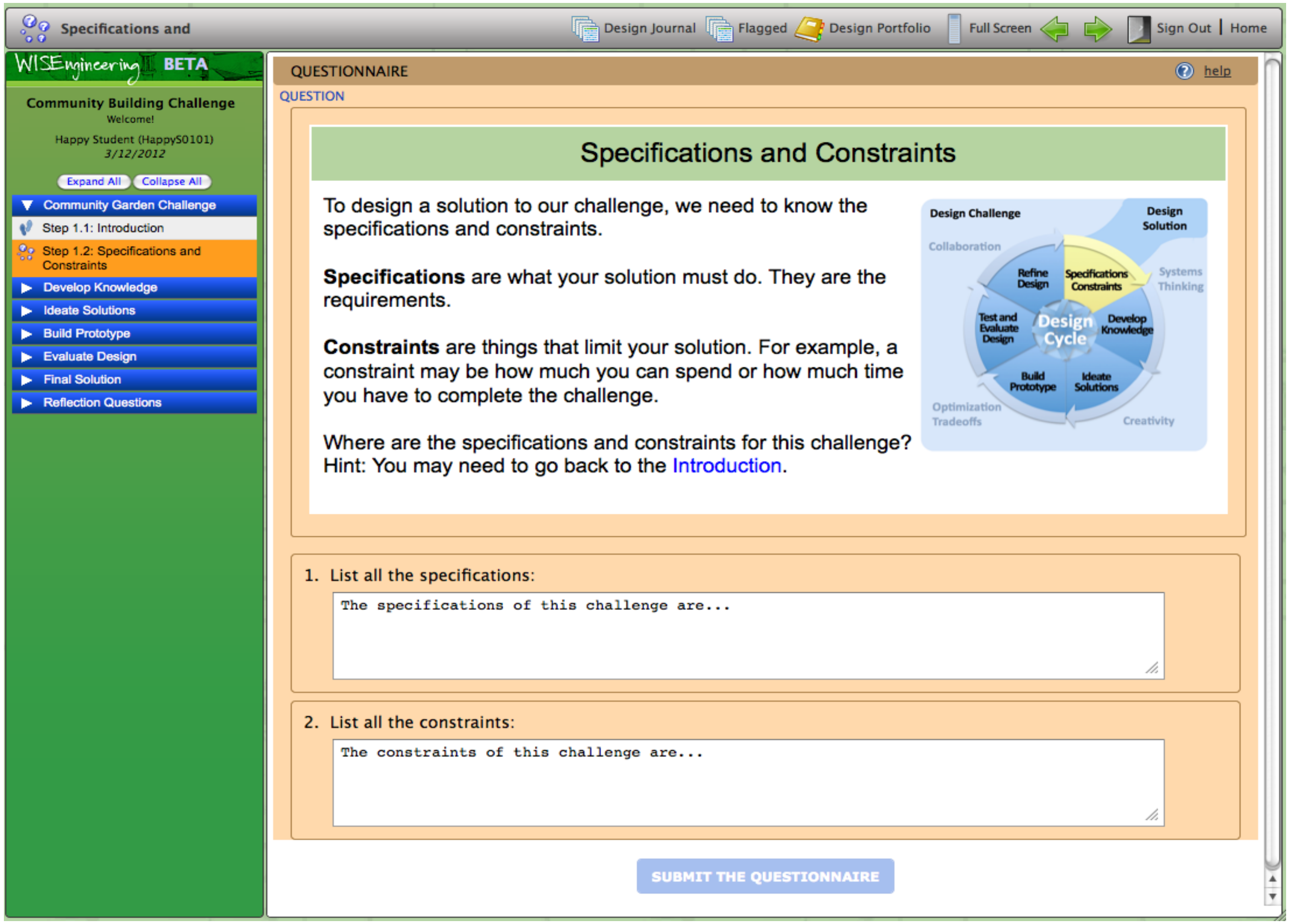
www.wisengineering.org



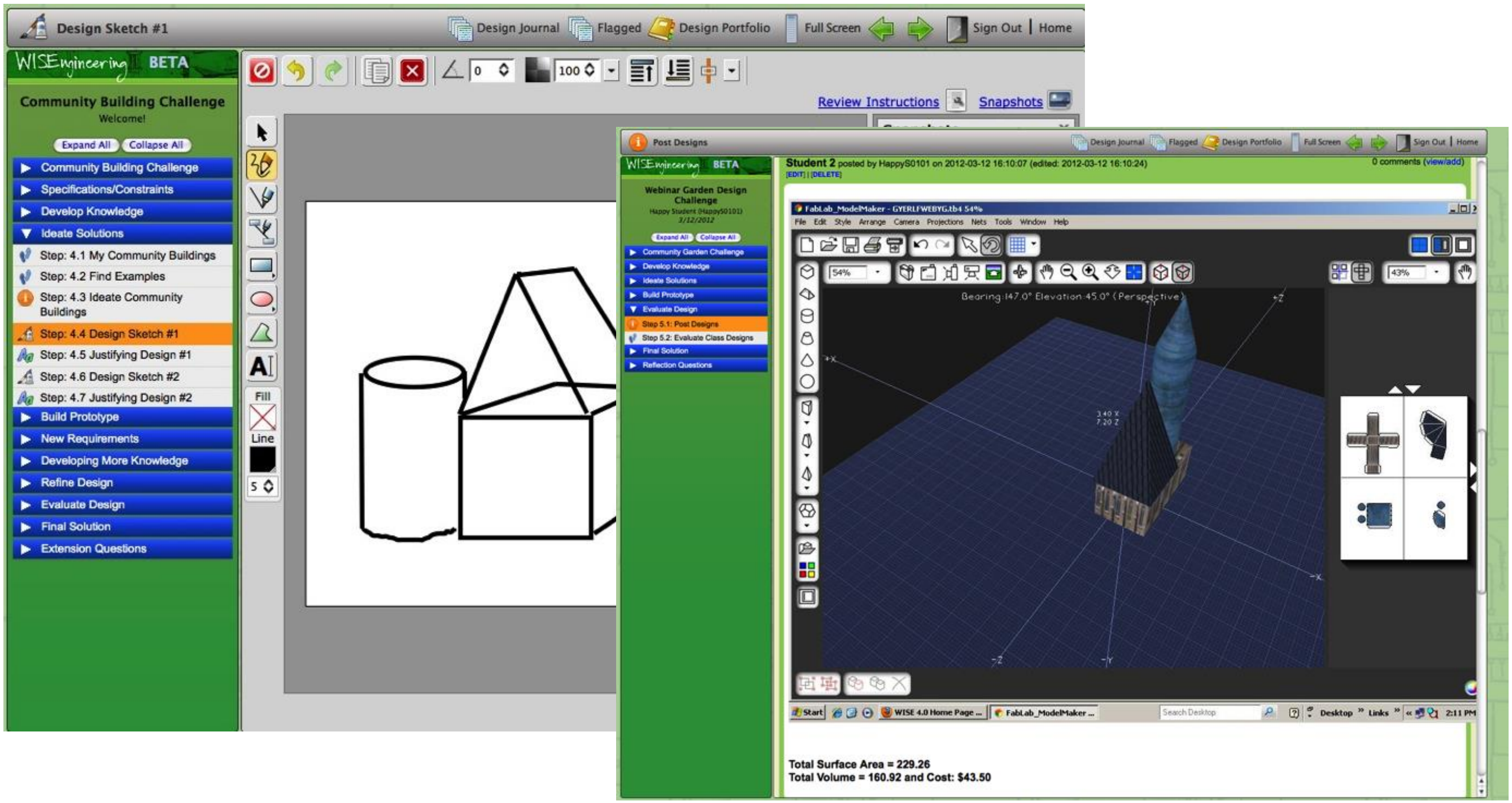
Supporting Engineering Design



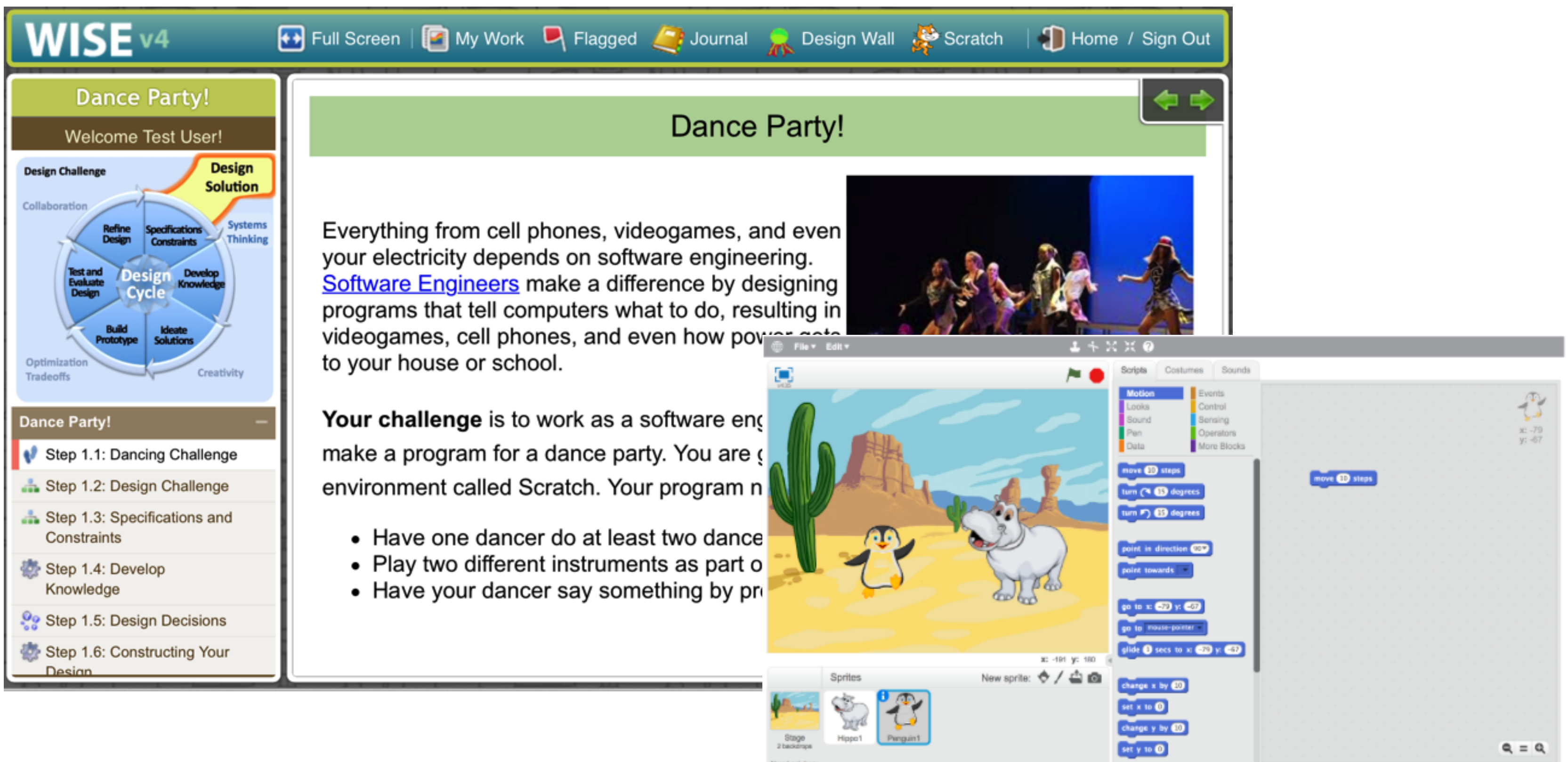
Defining problems



Developing and using models

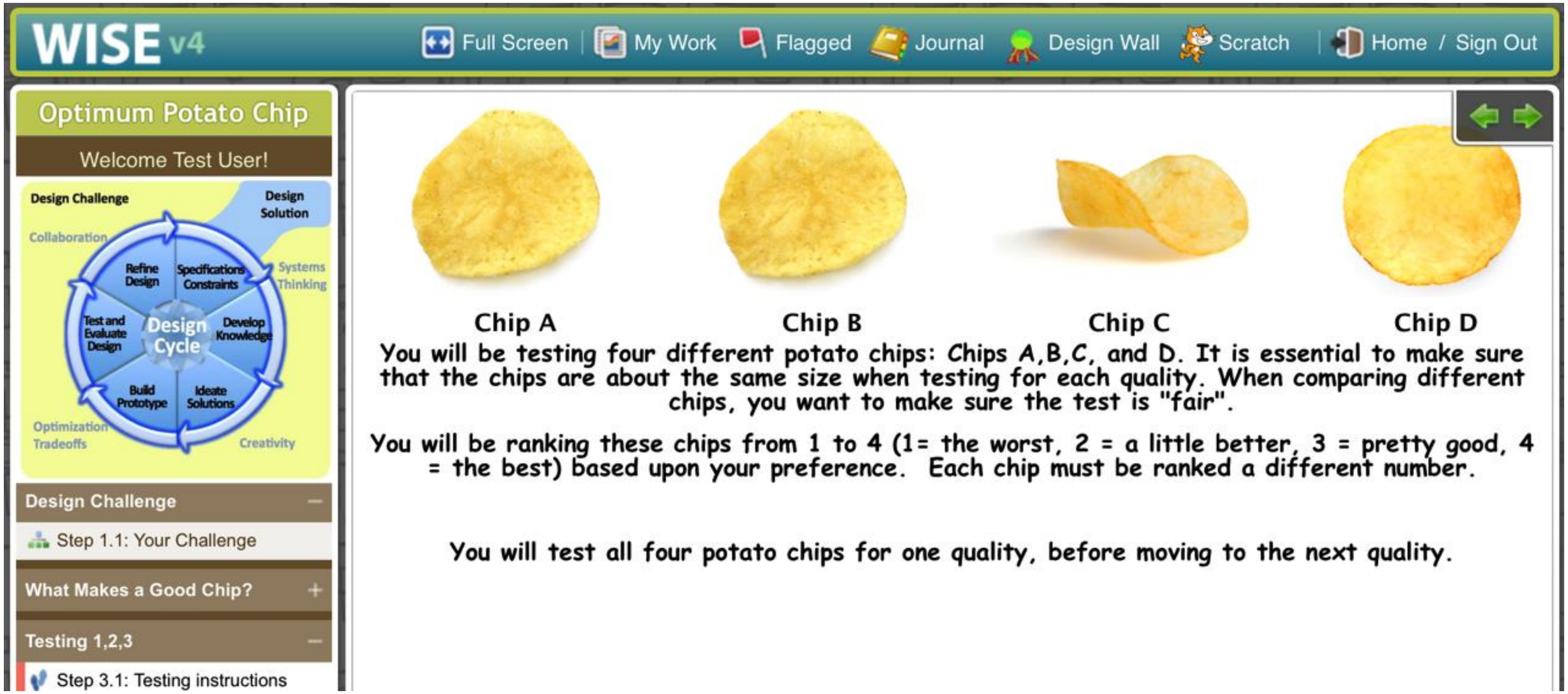


Using mathematics and computational thinking

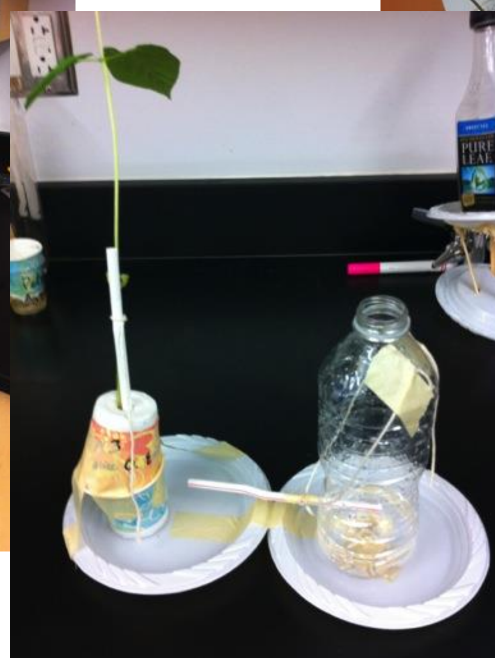


WISEEngineering

Planning and carrying out investigations



Designing solutions



Engaging in argument from evidence

WISEngineering

- Currently have Common Core mathematics (TEM), NGSS Science units (STE), Informal activities with tablet computers
- Working on integrating math and science in schools

WISEngineering

- Engineering is applying science to real-world problems – science teachers already do this well
- Potentially very motivating for students
- Difficult to assess, implement

Questions and Discussion

Thank you!

WISE and WISEngineering teachers

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