LEARNING MODULES

GK-12 DISSECT at New Mexico State University

Title: Scratch Introduction 2

Author: Mandy Peel, Kathleen Guitar

Discipline or Area: Geologic Timeline; Jurassic Period

Teacher: Kathleen Guitar

School: Vista Middle School

Subject of class: Science

Grade: 6th

COVERAGE OF COMPUTATIONAL TOPICS

The concept of algorithms as a sequence of steps used to solve a problem was reiterated. Variable, a value that can change, and iteration, the repetition of a sequence of steps, were introduced. The students also got hands on experience with computers and using a simplified programming language.

OBJECTIVES

Students will learn how to use Scratch to write algorithms to solve problems and visualize learning concepts. Students will also learn how to use variables and iteration.

EQUIPMENT AND MATERIALS

Handouts
Computers with Internet Connection

BACKGROUND AND REFERENCES

The purpose of this module is to get students comfortable with the basics of Scratch while reinforcing the geologic Mesozoic Era, specifically the Jurassic and Permian Periods, which was the lesson unit for that week. This module is also meant to introduce the students to the algorithms as programs, iteration, and using variables to make programs universal.

PROCEDURE

Provide detailed instructions on how this module is taught.

The first class was used to introduce Scratch to the students. We showed them the "Element Info" program to demonstrate how programs solve problems. We also talked about variables and how they were used in the program. We had the kids label a screen shot of a Scratch program so they would be familiar with the Scratch terms. Next, we went over how to get the Scratch webpage (www.scratch.mit.edu) and how to log in. Each class has its own account. Then, we built a very basic program together, which went over how to change the Sprite and Backdrop, and had two dinosaurs speak to each other. They had to use dinosaurs as sprites and had to choose an appropriate background for that time period since they were studying the Jurassic Period.

During the second class period, we expanded on their dinosaur program. They then had to have the dinosaurs talk to each other to complete a dialogue about the Permian Period and what kinds of animals lived before dinosaurs. We gave them the outline below to help guide them in making their dialogues.

What were the "learning goals?"

The learning goals are to learn how to use Scratch on a very basic level, while learning about algorithms, variable utilization, and iterative structures. The learning goals can also be adapted to the subject matter at hand. Our specific learning goal was to understand organisms and their habitats during the Jurassic and Permian Periods.

How did you introduce CT?

The term algorithm was reviewed as a vocabulary word, but in this module we showed how a program is an algorithm. We also discussed and demonstrated how algorithms and programs can be used to solve problems using the Element Info program. Previous weeks were spent on how to calculate the number of Neutrons, Protons, and Electrons an element has by looking at the periodic table. Since most of the kids had a lot of trouble remembering and executing this, the program provided a solution. The program also used variables to make it universal to the person running the program. We discussed their previous use of variables in their Mentos and Diet Coke experiment. We showed them how variables can be set to equal each other or set values.

How could you assess the understanding of CT in this module?

The assessment of the understanding of CT can be done by accessing the students' programs. Most students continued after setting their sprites and backdrops to making their sprites talk. IF the students followed the general sequence of steps given, such as sending and receiving sprite signals, then they understood the basics of algorithm programming. Continued assessment can be done on future Scratch projects, which we plan to implement throughout the following semester.

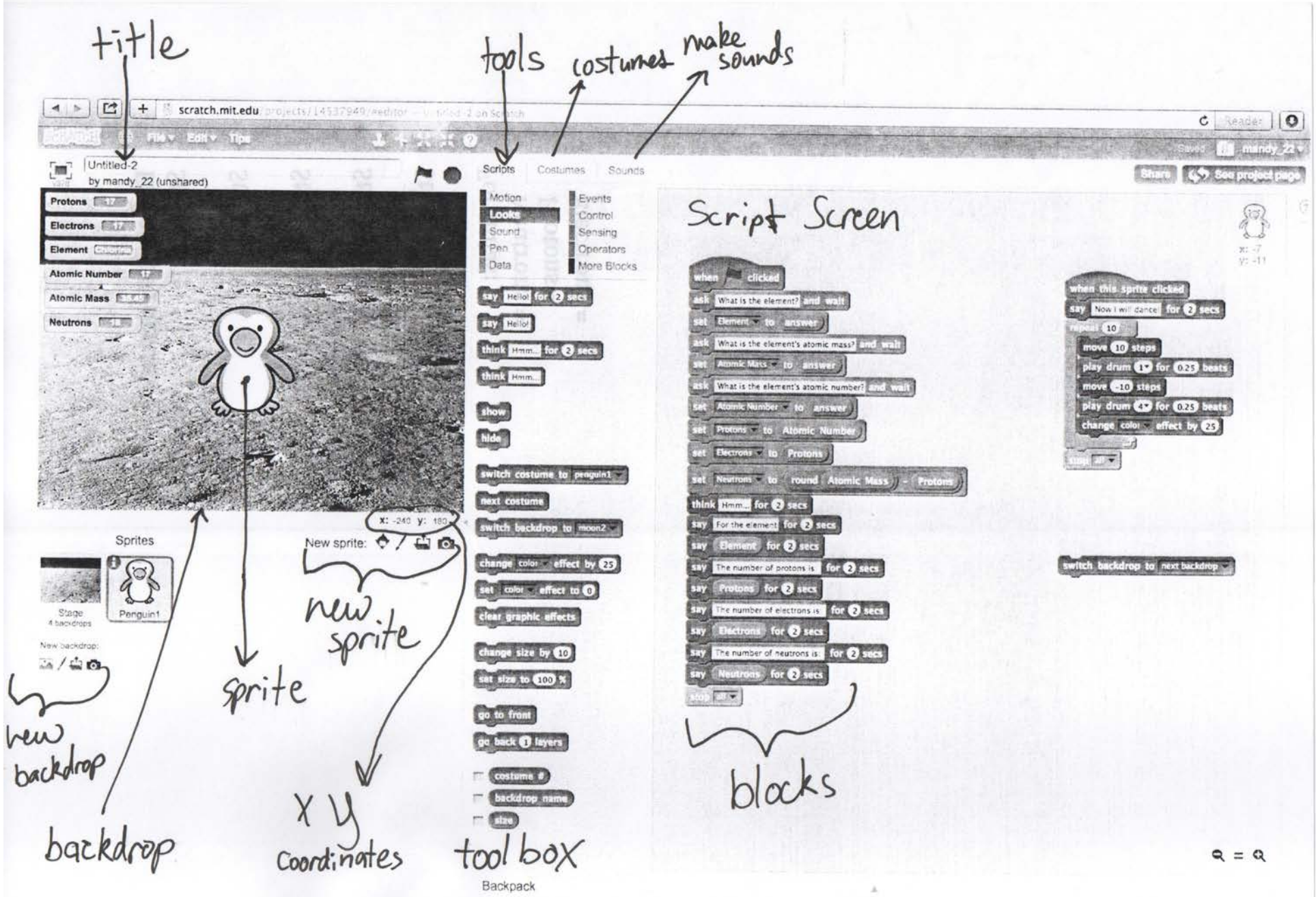
NOTES AND OBSERVATIONS

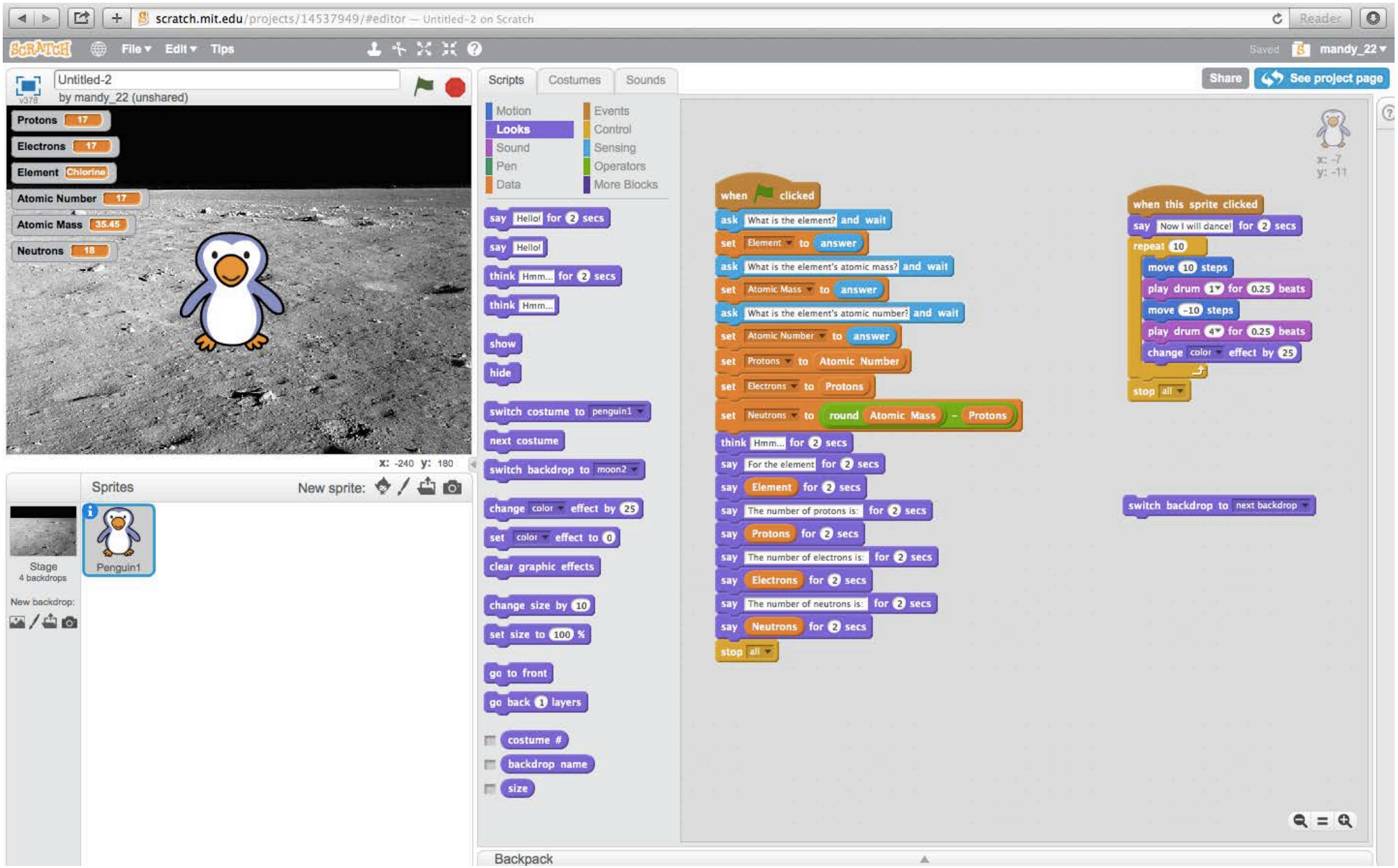
What were challenges you encountered in the overall development of the module?
During the first class, we really didn't have any challenges with the students, but we did run out of time trying to get through building their programs.

During the second class period, It was very difficult to get the kids to follow the algorithm of what blocks to use. It took a lot more instruction and individual attention than I thought it would.

What was successful?
The students were very excited to see programming, and they understood the concepts introduced and reviewed. The students were very enthusiastic about using computers and Scratch. All of the kids finished their assignment and many went on to explore more in depth Scratch concepts. Most students were very creative and liked making their sprites move and talk.

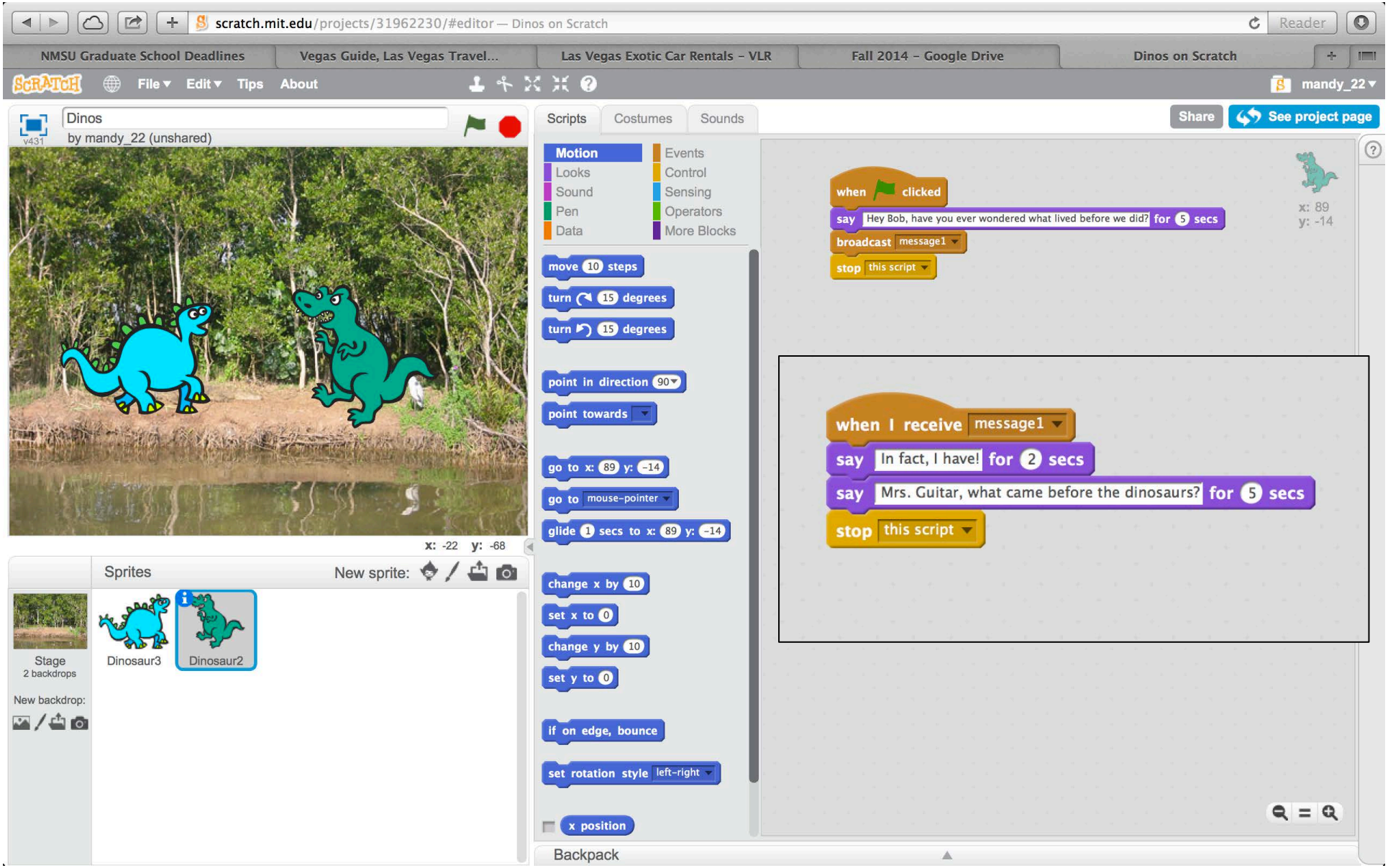
How was the students' reception to the content of the module?
The students loved this module. The next time I went into the classroom, they were asking me if we were going to do more Scratch. Some students even told me that they went home and used Scratch on their own time.


title
tools
costumes
make sounds
scratch.mit.edu
File
Edit
Tips
Untitled-2
by mandy_22 (unshared)
Scripts
Costumes
Sounds
Share
See project page
Protons
Electrons
Element
Atomic Number
Atomic Mass
Neutrons
Motion
Looks
Sound
Pen
Data
Events
Control
Sensing
Operators
More Blocks
Script Screen
when clicked
ask What is the element? and wait
set Element to answer
ask What is the element's atomic mass? and wait
set Atomic Mass to answer
ask What is the element's atomic number? and wait
set Atomic Number to answer
set Protons to Atomic Number
set Electrons to Protons
set Neutrons to round Atomic Mass - Protons
think Hmm... for 2 secs
say For the element for 2 secs
say Element for 2 secs
say The number of protons is for 2 secs
say Protons for 2 secs
say The number of electrons is for 2 secs
say Electrons for 2 secs
say The number of neutrons is for 2 secs
say Neutrons for 2 secs
stop all
when this sprite clicked
say Now I will dance! for 2 secs
repeat 10
move 10 steps
play drum 1 for 0.25 beats
move -10 steps
play drum 4 for 0.25 beats
change color effect by 25
stop all
switch backdrop to next backdrop
say Hello! for 2 secs
say Hello!
think Hmm... for 2 secs
think Hmm...
show
hide
switch costume to penguin1
next costume
switch backdrop to moon2
change color effect by 25
set color effect to 0
clear graphic effects
change size by 10
set size to 100 %
go to front
go back 1 layers
costume #
backdrop name
size
x: -240 y: 180
Sprites
Stage
4 backdrops
Penguin1
New backdrop:
New sprite:
new sprite
sprite
new backdrop
backdrop
X Y
Coordinates
tool box
blocks
Backpack


scratch.mit.edu/projects/14537949/#editor — Untitled-2 on Scratch
Reader
File
Edit
Tips
Saved
mandy_22
Untitled-2
by mandy_22 (unshared)
Protons 17
Electrons 17
Element Chlorine
Atomic Number 17
Atomic Mass 35.45
Neutrons 18
x: -240 y: 180
Sprites
New sprite:
Stage
4 backdrops
New backdrop:
Penguin1
Scripts
Costumes
Sounds
Share
See project page
Motion
Looks
Sound
Pen
Data
Events
Control
Sensing
Operators
More Blocks
say Hello! for 2 secs
say Hello!
think Hmm... for 2 secs
think Hmm...
show
hide
switch costume to penguin1
next costume
switch backdrop to moon2
change color effect by 25
set color effect to 0
clear graphic effects
change size by 10
set size to 100 %
go to front
go back 1 layers
costume #
backdrop name
size
when clicked
ask What is the element? and wait
set Element to answer
ask What is the element's atomic mass? and wait
set Atomic Mass to answer
ask What is the element's atomic number? and wait
set Atomic Number to answer
set Protons to Atomic Number
set Electrons to Protons
set Neutrons to round Atomic Mass - Protons
think Hmm... for 2 secs
say For the element for 2 secs
say Element for 2 secs
say The number of protons is: for 2 secs
say Protons for 2 secs
say The number of electrons is: for 2 secs
say Electrons for 2 secs
say The number of neutrons is: for 2 secs
say Neutrons for 2 secs
stop all
x: -7
y: -11
when this sprite clicked
say Now I will dance! for 2 secs
repeat 10
move 10 steps
play drum 1 for 0.25 beats
move -10 steps
play drum 4 for 0.25 beats
change color effect by 25
stop all
switch backdrop to next backdrop
Backpack

Dialogue Algorithm

Sprite 1	Sprite 2
Click on Sprite1	
When Flag clicked (EVENTS)	
Say (LOOKS)	
Broadcast MESSAGE1 (EVENTS)	Click on Sprite 2
	When I ReceiveMESSAGE1 (EVENTS)
	Say (LOOKS)
	Broadcast 2 (EVENTS)
When I receive 2 (EVENTS)	
Say (LOOKS)	
Broadcast 3 (EVENTS)	
	When I receive 3 (EVENTS)
	Say (LOOKS)
	Broadcast 4 (EVENTS)
When I receive 4	
Say	
Broadcast 5	


scratch.mit.edu/projects/31962230/#editor — Dinos on Scratch
Reader
NMSU Graduate School Deadlines
Vegas Guide, Las Vegas Travel...
Las Vegas Exotic Car Rentals – VLR
Fall 2014 – Google Drive
Dinos on Scratch
SCRATCH
File
Edit
Tips
About
mandy_22
Dinos
by mandy_22 (unshared)
v431
x: -22 y: -68
Sprites
New sprite:
Stage
2 backdrops
New backdrop:
Dinosaur3
Dinosaur2
Scripts
Costumes
Sounds
Share
See project page
Motion
Looks
Sound
Pen
Data
Events
Control
Sensing
Operators
More Blocks
move 10 steps
turn 15 degrees
turn 15 degrees
point in direction 90
point towards
go to x: 89 y: -14
go to mouse-pointer
glide 1 secs to x: 89 y: -14
change x by 10
set x to 0
change y by 10
set y to 0
if on edge, bounce
set rotation style left-right
x position
when clicked
say Hey Bob, have you ever wondered what lived before we did? for 5 secs
broadcast message1
stop this script
x: 89
y: -14
when I receive message1
say In fact, I have! for 2 secs
say Mrs. Guitar, what came before the dinosaurs? for 5 secs
stop this script
Backpack