

WorldWide Telescope Tour Making Seminar

April 2, 2011

1 Introduction

Worldwide telescope tours offer the unique experience of being able to record and share a visually stunning astronomically themed story. These stories can range from informal tours of objects to see at night, to formal lessons on astrophysics.

Students at all science levels can use these tours to creatively communicate their understanding of astrophysical concepts. They can then share the tours in a classroom and a digital planetarium, upload the screen captured videos of their tours to the web, and send their tours to the WWT Ambassador program database to be used by astronomy professionals and enthusiasts all over the country.

Undergraduate students in our seminar research a scientific topic, write a script for a specific audience, and draft a visual storyboard. Creating a tour from start to finish and sharing the tour with others gives students a deep level of understanding of a scientific topic and synthesis between researching and communicating science.

Our WWT Tour Making Seminar is adaptable for various timescales and teaching scenarios. The creation of one tour took our sophomore students about 10-20 hours depending on the scope and complexity of the tour. Learning WWT and tour creation took our students about 5 hours. We present curriculum for a stand-alone seminar that could be integrated into an astronomy course as a project.

2 Instructor Preparation

This seminar is especially low overhead for the instructor who should before the seminar:

- create a list of tours and descriptions
- be knowledgeable enough in WWT to help students learn
- be able to address science communication issues such as:
 - choice of audience

- use of jargon
- distilling information vs. dumbing down
- use of silence

3 Scope and Sequence

For a 10-week quarter, we have each student create two tours. We teach the following 6 sessions, and then repeat 3-6 for the second tour (See Figure 1).

4 Before the Seminar

4.1 Choice of Tours

We came up with twice the number of tours than could be assigned in one seminar. We wanted students to feel like they were doing an assigned tour that they were already interested in or had prior knowledge of. The second tour would be up to them to create, and they were encouraged to think about possible topics while working on the first tour.

4.2 Creating the Syllabus

4.2.1 Seminar Description

This was a 2-credit independent study to make WorldWide Telescope Tours for use by anyone. We met weekly to discuss narrative, story boarding, conveying information simply, using the WorldWide Telescope software, and any other issues we come across while making tours.

4.2.2 Projects

Each student will make at least 2 tours. One tour will be of an assigned topic the other will be of the student's own choosing. The tours should be high quality: they should take about 10 hours or so to make and they could be shown in our planetarium. The length of a tour depends on its content.

4.2.3 Seminar Objectives

Upon completion of this seminar you will be able to:

1. make WWT tours and teach others
2. give a planetarium show, specifically about a topic you just investigated
3. distill scientific information for communication purposes
4. explain the astronomical topics of your tours in great detail to just about anyone

4.2.4 Expectations

We will meet weekly as a group to discuss progress and help other students. Each student is expected to use constructive criticism to critique others work.

5 One

Students choose their tour topics. Students can choose their own topics (for more advanced students, and in our seminar, for the second created tours). The instructor should be careful to notice if the studentsâ wish to create a tour that would take too long, or be very technically involved.

Between week one and two, students are expected to start researching their topic and take time to learn WWT on their own. We provided our students suggested places to start, where to reach a windows computer, etc.

5.1 Learning WWT

We believe the best way to learn WWT is to play around with it. We give our students an open-ended outline of things they should be able to do in WWT. Next session, they will demonstrate WWT to other students in class.

Besides the WWT help files that come with the downloaded software, the WWT Ambassador Program has resources on learning WWT and tour making: <https://wwtambassadors.org/wwt/>

Students should be able to:

- Find constellations, a famous galaxy, and a planetary nebula.
- Switch back and forth from optical, Xray, H-alpha, and dust all-sky maps.
- Turn on/off grids, planet orbits, slow down and speed up time
- Play a tour, pause it, look around, keep playing it
- View each planet (in 3D solar-system mode),
- “fly” to a background star,
- Zoom out to see the 3D Sloan galaxy set
- Pull up a spectrum of one of the galaxies in the Sloan Galaxy data set.

6 Week Two

The students spend the first half of class taking turns demonstrating the use of WWT.

The second half of class explains their next task (in addition to their on-going research)

Show storyboard, explain script basics, use of silence, numbers with context
More information about storyboards
<http://en.wikipedia.org/wiki/Storyboard>
<http://accad.osu.edu/womenandtech/Storyboard> And a template:
http://m113mc.files.wordpress.com/2009/02/storyboard_template.jpg

Between week two and three students should continue to research, learn WWT, and craft:

1. A draft of the script
2. A rough storyboard of their tour (See Figure 2)

7 Week 3

Every student pitches their tour to the group who acts as an editorial board. Suggested questions to ask: Howâs the structure and Transitions? Was anything confusing? What jargon was used and how necessary is it? What context was given, was it enough? These questions will be continually asked when students show their tour progress.

8 Week 4,5

Check in with the students to see how far they are, what slides are they on, are they having technical difficulties. In the classroom, we would show partially finished tours and talk about science communication issues as they came up.

The most common issues we talked about were:

- Audience: Our students were writing tours for their peers, other first and second year college students.
- Jargon: Using terms with very exact definitions is useful to all scientists but can hamper and alienate people approaching the topic. Whether or not to use jargon is a tricky issue that has a lot of exceptions.
- Using Numbers: When to give more context, what units to use.
- Use of Silence: Silences in tours are a time to create emphasis and let the minds of the viewers wonder.
- Using an Analogy: When are they necessary, brainstorming which are useful.

9 Week 6

Make some popcorn, invite friends, and showcase the tours!

10 Conclusion

10.1 Feedback

Below is a rough summary of the student and instructor feedback about difficulties throughout the seminar

- Planetarium mode not finished, tours from laptop to planetarium needed some adaptations.
- Some images in WWT are not astronomical (Pluto, Neptune)
- Getting a laptop or computer with WWT can be an obstacle
- Voice-overs: sound recording software wasn't always available or known by the student, adding a layer of complexity

Free form student feedback on the Seminar

“overall this course was AWESOME :] This project is definitely the coolest thing I have done at UW thus far and I would love to stay involved with the planetarium in any way possible.”

“I hope to become an expert at using WWT and to increase my knowledge about our universe. I want to become more confident in my presentation abilities, and be able to clearly explain my presentation topics. This project might be able to help me decide a little if I like teaching astronomy, and also gives me the fun opportunity of working in the planetarium.”



Figure 1: Instructor and student outline of seminar. Bold: Topics in seminar meetings, Faint: Work to do between meetings

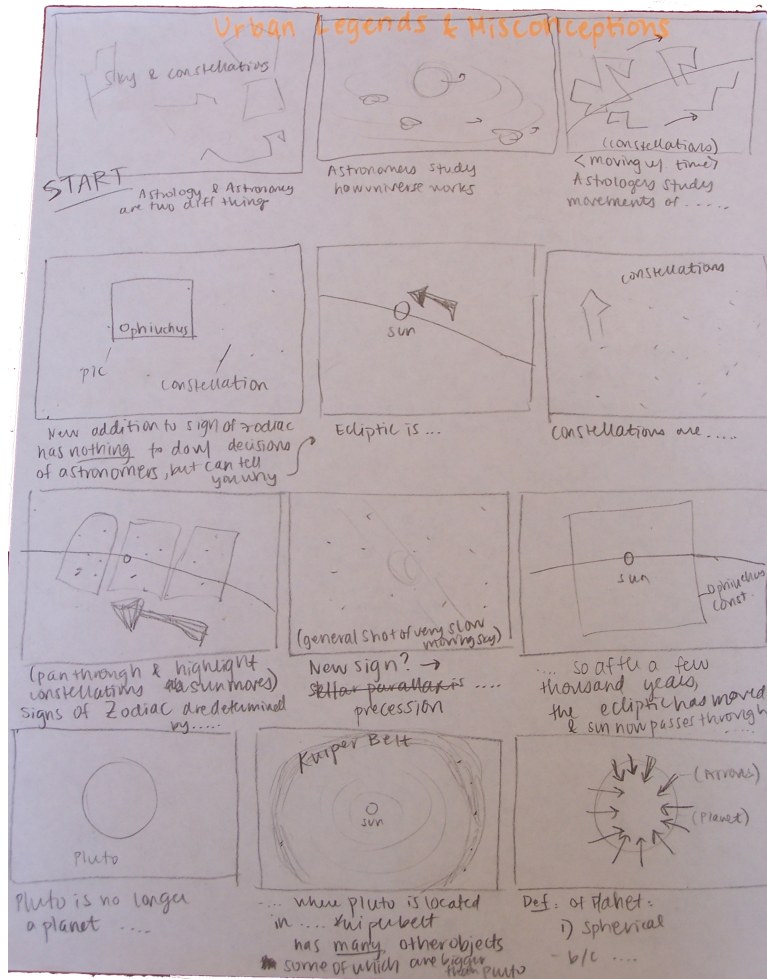


Figure 2: Snippet of Kathryn Steakely's storyboard for her second tour "Urban Legends and Misconceptions"