U-M Museum of Natural History

PORTAL to the Public

Professional Development Workshop and Activity Development Manual

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Activity 1: Pleasure of Finding Things Out

This activity is to help you to develop a sense of how people learn and the nature of learning in informal environments. Through this experience you will see the importance of developing personal connections with learners based on shared experiences. Part of what makes the museum special and valuable to the larger University community is that our visitors are looking to make a connection to the work being done on campus.

When you are thinking of your activity remember the feelings that you experienced during this activity.

What are some words that can describe your feelings, or the feeling of the room during this activity?

What was it about exploring these boxes that kept you interested?

What qualities of the activities and materials encouraged exploration?

Activity 2: Questioning Strategies

This activity will help you to understand the different types of questions you can use in your interactions with the public. You will begin to understand the importance developing personal connections through shared experiences. People learn differently in informal learning environments than they do in classrooms. You are not only reaching out about your research, but you are also ambassadors for science and the University.

Questions are very powerful tools. They can be used to interrogate or draw people in. They can inspire curiosity or be a source of intimidation. In informal learning environments people are open for learning but will balk at being put on the spot for fear of being wrong.

The "WHY" Issue

"Why" seems like such a simple question, but for a lot of visitors it is a troubling little word. Although it is an open ended question, it requires visitors to think of the implications of many other factors before formulating a response. Instead of giving you a response that will move your interaction along, the answer to "why?" will usually be met with "I don't know" and you guest will likely shut down from fear of being wrong or being overwhelmed. Instead of the looming "WHY" use a series of other question types to get the response you are looking for.

There are several types of question families that you can employ in your interactions with the public depending on what you are hoping to accomplish. **Opening questions** like "would you like to try this" or "would you like to help me solve this problem" draw people in. The type of opening question you use can set the tone for your interaction. **Exploration questions** encourage active play, experimentation, discovery and thoughtfulness. These questions help the visitor to access prior knowledge. These are they types of questions you use in the middle of your interaction. The last category of questions is **meaning making.** Things like "What do you suppose the connections between X and Y might be?" or "What do think we would learn if we repeated this experiment again and again?" are supposed to make people think and internalize the experience.

Activity 2: Questioning Strategies

Opening Questions:

Exploration Questions:

Making Meaning Questions:

Caveat 1: Using Experiential Analogs

We would be incredibly lucky if we could transpose your lab into the museum and simply beam the requisite knowledge into their heads. Alas that is not so, instead we have to rely on analogs to get the point across. Think about what physical experiences are analogous to the concepts you are trying to convey. Genuine understanding comes from an active experience. There are many different types of analogs but the biggest bang for your buck is the functional analog. This is when you are comparing things that don't look the same, but have function in the same way.

Analogs of Identity $3=3=2+1=\sqrt{9}$

Analogs of Function reproduction processes of animals and the reproduction processes of flowers

Analogs of Consequence decrease in global warming consequent to clean industry or global epidemic

Scientific Concept	Analog

Activity 4: Building a Common Vision

Scientists have trained long and hard to be good at their jobs, all of this training makes it difficult to put yourself in the shoes of the public. We call this the "expert blind spot". The more you know about a subject the harder it is to remember what it's like to know nothing about it at all. This activity will put you in the position of being a learner of a subject you don't know well, by the end you will have strategies on how to convey complex concepts to others. Remember, when talking about your work with the public you need to start where they are and lead them to where you want them to be.

Where is your expert blind spot?

What concepts do you want to practice describing to non-experts?

How can you "frame" your topic to build the nescessary context and relevance for your audience?

How can you help people feel safe and comfortable when they are talking to "The Expert" (you)?

Next Steps

Thank you for participating in our Portal to the Public Professional Development workshop. In our workshop we have given you a basis to think about how people learn in informal environments, how to rediscover what made you passionate about science in the first place, what inquiry based learning is and techniques to translate your science into terms that the general public can understand. There is no way to express how rewarding working with the public can be and hopefully you will feel the same at the end of your project. The following pages are a few reflection exercises to help you develop your activity and refine your presentation. Bear in mind that while it is appropriate to rehearse and have a plan on what you are going to say, we do not recommend you try to develop a script at all. When you test out your activity on friends, family members or colleagues, try to focus on word choice and appropriate language (read: no overly technical jargon).

As part of Portal to the Public program the museum asks that you interact with the public for 6 hours total. Those can be consecutive at one event, or spread over several days. Please make sure to contact either Kira Berman or Amanda Paige before you come to the museum so they can make sure that you have all the resources you need and that the staff in charge aren't caught off guard. If you are doing PoP in conjunction with Science for Tomorrow, please plan to be at Campus Day which is usually late April.

Museum Public Events

Event	Date	Time
Fun Friday Night at the Museum	1st Friday of month	6pm to 9pm
ID Day	Sunday 10/6	12pm to 5pm
Space Discovery Day	Saturday 12/7	9am to 5pm
Behind the Scenes Day	Sunday 2/9	12pm to 5pm
Kids Night In Mini-camp	Friday 2/14	6pm to 9pm
Discovery Day	Saturday 3/22	9am to 5pm
SFT Campus Day	TBD before commencement	9am to 12pm

Reflection 1: Scientists Find Their Stories

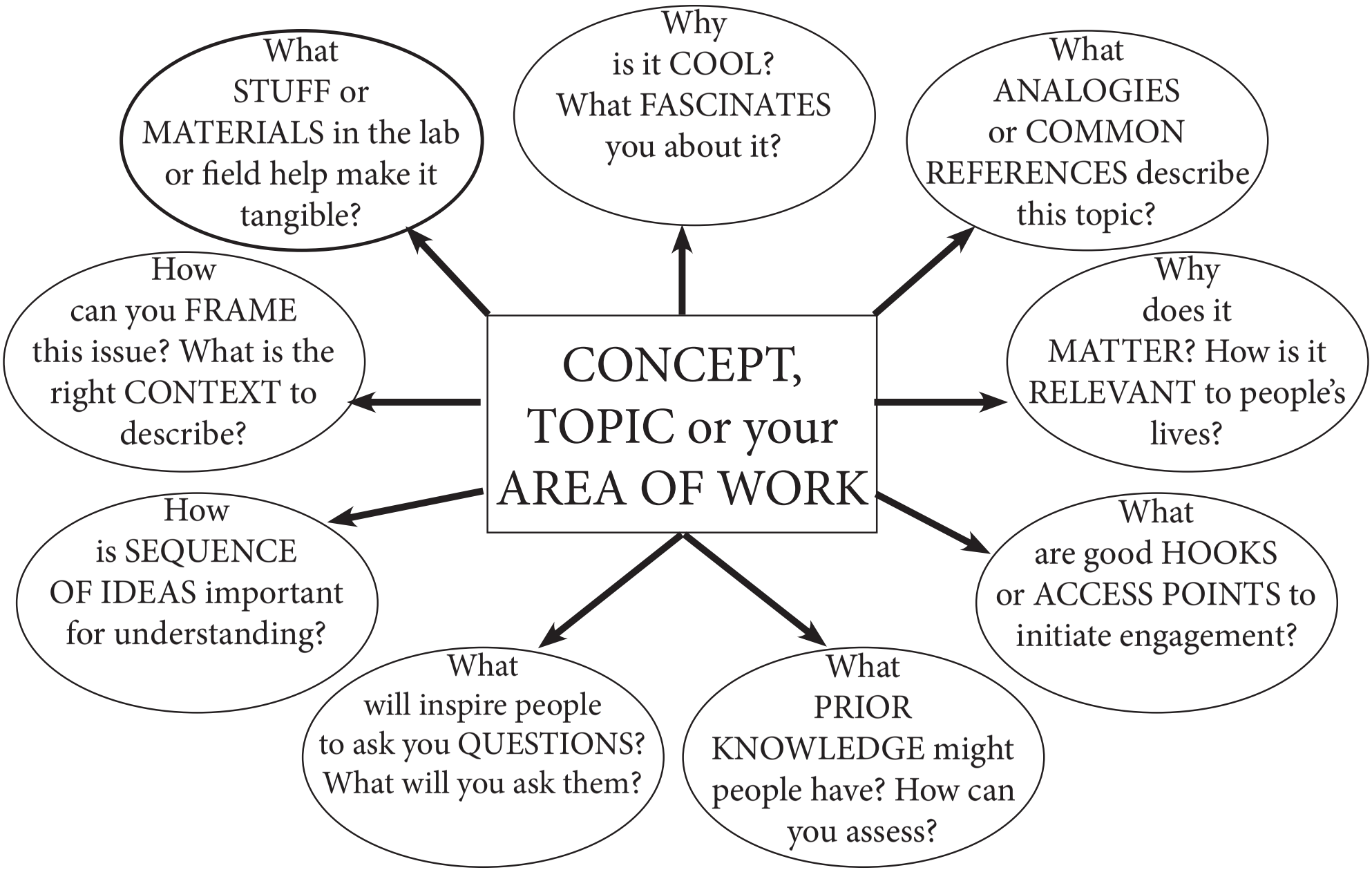
Part of the reason we want you to share your work with the public is to increase their understanding of and passion for all science. Statistics show that far too many Americans don't have a basic understanding of the scientific method/scientific principles despite the vocabulary becoming more commonplace (***http://www.nsf.gov/statistics/seind04/c7/c7s2.htm*** and ***http://www.nsf.gov/statistics/seind04/c7/c7s2.htm#sb1***). Frequently, people lose their love of science in middle school and don't regain it. You bucked that trend and we need you to remember why.

For inspiration you can watch the following videos of other scientists telling their stories.

- Andrew Lerwill- http://www.youtube.com/watch?v=Cc2cMMU0L7c (2.5 minutes)
- Bernadette Hernandez-Sanchez (a PoP scientist at Explora)- www.knme.org/sciencecentral

Use the space below to reflect on what brought you to science in general and to your field/research in particular. Think about how physical materials may have played a part on your attitudes towards science.

Reflection 2: Concept Mapping



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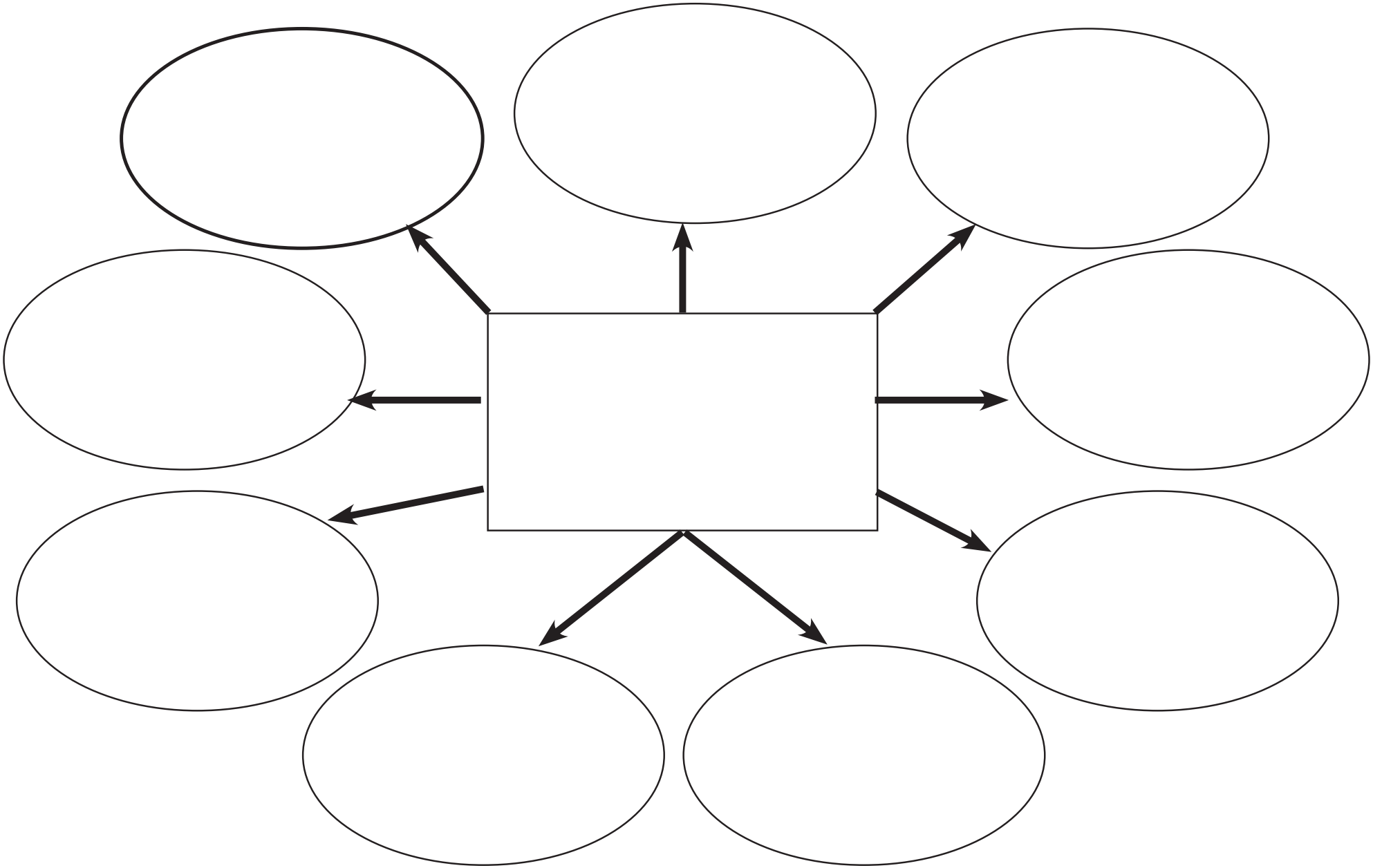

Reflection 3: What's in a Word?

Think back to your days in school and what was one of the key things that English teachers stressed over and over? Keep it clear, remember what audience you are speaking to. As you have progressed in your careers your audience has gotten more and more sophisticated and so has your language. With that sophistication comes specialized language or uses of words that differ from conventional speech. While some bits of jargon have entered the language, by and large it's a very alienating thing to use around your non-scientist audience. That being said, sometimes it is impossible or detrimental to not use specific language all the time. While you are thinking about your activity, also think about your interaction with the public. What are you going to say? Don't devise a script, but use the space below to identify some jargon or over complicated language that might seep into your delivery and come up with alternatives -OR- solutions for giving the public the understanding they need (short of handing them a dictionary).

TERM	PROBLEM	ALTERNATIVE

TERM	PROBLEM	ALTERNATIVE