

# Guideline Principles for Designing Astronomy Activities

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## 1. Introduction

We astronomy outreachers are passionate about sharing astronomy widely—but many astronomy outreach activities are designed more by how we *hope* things will work than in a careful intentional way. We also rarely evaluate how well our activities are achieving our goals. As a result, many educational activities must be *significantly less effective* than they could be. Fortunately, there is a large body of education research on how people learn. If we are serious about sharing astronomy widely and effectively, we must treat our teaching like research: (1) Have clear goals for our outreach, evaluate how well we are achieving our goals, and revise our strategies in light of what we learn; and (2) Use appropriate teaching techniques supported by education research wherever possible.

I have summarized a few top teaching principles from education research to help design effective astronomy activities. A more detailed 2-page version is available at: <http://www.cita.utoronto.ca/linda/eduresearch.pdf>.

**(a) Be strongly goal-oriented in designing and evaluating activities:**

- (a) Clearly state your goals for your learners (see below).
- (b) Determine what evidence would tell you your learners are reaching your goals.
- (c) Design your activity to help your learners achieve these goals.
- (d) During / after the activity, evaluate how well learners have achieved your goals.
- (e) Use what you learned about your students to revise the activity, for the future.

**(b) Choose your learning goals carefully:**

Three different important types of goals concern:

- (a) Scientific content — **What do we want to students to know/understand?**
- (b) Scientific process skills — **What do we want students to be able to do?**
- (c) Scientific attitudes — **How do we want students to feel about science / education in general / life?**

## References

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