A “Flipped” Approach To Large-Scale First-Year Physics Labs

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**Features**

- Inquiry-based, peer-discussions with clickers
- Phase 1: Builds Experimental Skills and Understanding of Data (8 weeks)
- Phase 2: Final Lab Project with Presentation (3 weeks)
- Homework connects labs:
  - Experiment at home – bring data to next session
  - Analysis at home – bring result to next session

**HW Marking**

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**Lab 1:**
Introduction to Uncertainty

**HW1:**
Experiment: Measure walking speed

**Lab 2:**
Graphical Representations

**HW2:**
Graph: Histogram of walking speed on two terrains

**Lab 3:**
Quantifying Distributions

**HW3:**
Experiment: Does mass or length influence the period of a pendulum?

**Lab 4:**
Computer-based data acquisition

**HW4:**
Analyze: Plot distributions and compare two data sets.

**Lab 5:**
Friction Experiment

**HW5:**
Graphing: Use Excel to make scatter plot. Add trend line.

**Lab 6:**
Best Fitting Lines

**HW6:**
Graphing: Use Excel to make scatter plot. Add a non-linear function.

**Lab 7:**
Predictions and Extrapolations

**HW7:**
Graphing/Analyze: Add error bars to scatter plot. Fit a trend line and make a prediction.

**Lab 8:**
Working with graphical representations

**HW8:**
Think about a question and a plan for your final project.

**Feedback Session:**
Discuss project plan with peers and TAs.

**Presentation Session:**
Present your experiment.