Testing Procedures

In addition to collecting pre- and post-test data, you will need to sign the Participant Consent form and collect Parental Consent forms from each of your students. Both are provided as part of this document, with instructions included on the next page.

Each instrument is designed to take 30 minutes to complete. *Please be sure to keep a firm, 30min limit.*

Here is a sample script for the procedure:

You are all here today because you have been selected to help conduct a scientific study. We want to find out how much you and your classmates are able to learn this year, and we need your help to do it!

What do you think are some ways to figure out how much you learn between now and the end of the year?

[Have students volunteer some ideas]

One way to measure this is to give you some questions at the beginning of the year, and another set of similar questions at the end. If the questions are too easy and everyone gets the right, there won't be any way to see improvement. The same goes if the questions are too hard! The trick is to have a mix of easy and hard questions.

Today we are going to give you a few questions to answer. The questions are divided into two groups, and you will have forty-five minutes to complete them. Some of these questions may seem very easy, while others will be more challenging. Some will involve math you may not even have seen yet!

If you don't know the answer to a question, don't worry: that's all part of doing a good experiment! Just do the best you can, answer honestly, and if you get stuck on something just move on to the next question.

[Pass out the Instrument, and collect the papers after 45minutes.
Be sure they've put their names on them!]

[Thank students for their participation, and sort the tests by name. Once you've redacted the names from each test, return them to Bootstrap.]

Participant Consent Form

Thank you for volunteering to be part of our study for Bootstrap! Your participation will help us improve and refine the curriculum, and help us learn the impact of functional programming on students' understanding of algebraic concepts.

Procedures for Participants

Participants will teach Bootstrap as part of their normal classroom practice this year, devoting the recommended 15-25 hours of time to the material with at least a 90min of in-class instruction per week, and with class periods lasting a minimum of 45min each.

Participants must use the same lessons and techniques covered in the curriculum and PD workshops: Circles of Evaluation, Contracts, workbooks, Design Recipes, and consistent vocabulary for key terms.

Participants will also be responsible for:

1) Collecting and mailing consent forms from *you* and the legal guardians of students[1]
2) Conducting our Pre- and Post-tests, and mailing these results to us
3) Participating in a short (less than 30min) conference call, 1x a week

Participants are free to withdraw from the study at any time.

Potential Benefits and Risks to Students

All students will learn to program a game of their own design, but they may learn a great deal more: the choice of curriculum and pedagogy is designed explicitly to help their understanding of algebra.

While the Pre- and Post-tests may cause some anxiety for students, we do not foresee any undue strain or harm to children who participate.

Confidentiality

To protect students' privacy, participants must redact student names from the Pre-and Post-tests (replacing them with numbers so we can match them). This way, the only identifying information collected will be the parental consent forms for them to participate. *All test data will be completely anonymous*.

[1] Some schools or organizations already have explicit parental consent for student data to be used in external evaluations, (e.g. – The Citizen Schools Apprenticeship Application, a School's entry application, etc.). If so, you can send copies of these forms in place the one provided here.

Participant Signature

To participate in the study, please fill out the four (4) blanks in the form below with your name, date and signature.

I, Emmanuel Schanzer, have discussed with _____, the above procedures, explicitly pointing out potential risks or discomforts. I have asked whether any questions remain and have answered these questions to the best of my ability.

9/27/2013 _____
(date) (investigator's signature)

The nature and purpose of this research have been satisfactorily explained to me and I agree to become a participant in the study as described above. I understand that I am free to discontinue participation at any time if I so choose, and that the investigator will gladly answer any questions that arise during the course of the research.

_____ _____ _____
(date) (participant's signature) (print name)

To Contact the Researcher, write to Emmanuel Schanzer at ets272@mail.harvard.edu or Jon Star (faculty advisor) at mailto:Jon_Star@harvard.edu.

Whom to contact about your rights in this research, for questions, concerns, suggestions, or complaints that are not being addressed by the researcher, or research-related harm: Committee on the Use of Human Subjects in Research at Harvard University, 1414 Massachusetts Avenue, Second Floor, Cambridge, MA 02138. Phone: 617-496-CUHS (2847). Email: cuhs@fas.harvard.edu.

Parental Consent Form

This year, your child will have the opportunity to learn computer programming as part of their normal math or technology class. During the programming portion of the class, s/he will be able to design and write their own videogame, as part of the Bootstrap curriculum (you can find more information at http:// www.BootstrapWorld.org).

Your child's teacher has selected Bootstrap because of its strong connections to Common Core Standards for algebra and mathematics. Your child will learn a programming language in the context of a creative project, but they will also have the opportunity to apply mathematical concepts to solve real-world problems.

Why Consent?

Your teacher has been selected to participate in a study of Bootstrap's impact, to help improve the program and measure it's effectiveness. This participation asks teachers to share student scores on a pre- and post-test, which your child will take as part of the class. These results will help improve the curriculum, and may improve the delivery of the class to your child or other children.

We are writing to ask your permission to share these scores with the research team that is working to improve Bootstrap. If shared, these scores will **not** have your child's name attached. Only the score itself will be shared with the research team.

Will this be confidential?

Yes. The **only** information shared with the research team is this consent form, and the anonymous pre and post-tests. Neither the consent form nor the tests will be shared with anyone outside the research team. In addition, you are free to withdraw your consent at any time.

YES – I'd like to participate!

The purpose of this research has been satisfactorily explained to me, and I agree to have my child's anonymous scores shared as part of the study. I understand that I am free to refuse to participate or discontinue my child's participation at any time if I so choose, without any penalty or loss of benefits to which my child is otherwise entitled, and that the investigator will gladly answer any questions that arise during the course of the research.

_____	_____	_____
(date)	(signature)	(print name)

To Contact the Researcher, write to Emmanuel Schanzer at ets272@mail.harvard.edu or Jon Star (faculty advisor) at mailto:Jon_Star@harvard.edu.

Whom to contact about your rights in this research, for questions, concerns, suggestions, or complaints that are not being addressed by the researcher, or research-related harm: Committee on the Use of Human Subjects in Research at Harvard University, 1414 Massachusetts Avenue, Second Floor, Cambridge, MA 02138. Phone: 617-496-CUHS (2847). Email: cuhs@fas.harvard.edu.