

Grade 2-3 Lesson Modification and Kit Development

IQP Student Schedule

For a more in-depth discussion of writing an IQP, please see:
<http://www.wpi.edu/Academics/Depts/IGSD/IQPHbook/ch8d.html>

The following is a guide, to be discussed and modified by your team and project advisor

- I. A-term
 - a. Clearly define **Problem Statement**: (*final form by week 1 of A-term – discuss with advisor*)
 - b. Read “Yardsticks” chapters for ages 6 – 9 years; provides background of children’s knowledge/skills/development (*finish reading before beginning other work*)
 - c. Conduct **Literature Review** (*final form by week 5 of A-term*)
 - i. Obtain *at least* 10 relevant sources
 - 1) Summarize relevant articles
 - 2) Interview MA educators
 - 3) Find other schools which are using kits – conduct interviews
 - 4) Research the PIEE project – Be brief: What is it? What is WPI’s role? (see <http://www.wpi.edu/Academics/PIEE/About/> and <http://www.wpi.edu/Academics/PIEE/Publications/nsfproposal.pdf>, to start)
 - ii. Create **Bibliography and Annotated Bibliography** (*final form by week 5 of A-term*)
 - d. Create **Glossary** (*final form by week 5 of A-term*)
 - e. Create electronic **Table of Contents** within working IQP draft
 - f. Read existing lesson plans: determine which lessons require kits (*discuss with PIEE fellows, advisors*) (*begin week 2, A-term – finish by week 4, A-term*)
 - i. Create chart of “Benchmarks” addressed by each lesson
 - ii. Ensure – **critical point** – that **all** technology/engineering benchmarks are addressed by at least 2 lessons
 - 1) List any benchmarks that lack at least 2 lessons: you will develop these lessons, eventually
 - g. Write working draft of **Methodology** (*finish draft by end of A-term*)
 - i. Use **Problem Statement** (see I.a. above)
 - ii. Write *short* “Introduction” to Methodology – describe *why* your team chose the given methodology
 - 1) briefly describe why this methodology is relevant
 - 2) briefly describe *your* role in the PIEE project
 - iii. Describe your sampling strategy or planned statistical analysis (if relevant)
 - 1) determine access to necessary data
 - 2) ex. Surveying teacher/student reactions to kits/lessons
 - 3) ex. Surveying best methods of revising/updating kits
 - 4) ex. Analyzing *all* students or a “random” sample...discuss with advisor

- iv. Describe any tangible products you might create (*discuss with MA educators and WPI advisors*)
 - 1) ex. Grade 3 Binder with all lessons and supplemental materials (electronic and paper copies)
 - 2) ex. Self-contained kits
 - 3) ex. Assessment sheets
 - v. Explain how these products relate science/technology to society (definition of an IQP)
 - h. Develop procedure to collect teacher/student feedback regarding lessons (*week 3, A-term – discuss assessment strategies with Paula Quinn (email)*)
 - i. Begin to implement lessons/kits in classrooms (*week 4, A-term*)
 - i. Observe students using kits
 - ii. Discuss lessons/kits with WPS teachers – use assessment methods to obtain teacher/student feedback (**very important**) – Carefully document feedback – extremely useful to future educators!!
 - iii. Revise lessons and kits to reflect feedback
 - j. Review and edit Grade 3 lesson plans *after* collecting teacher commentary: make lessons **perfect** – the PIEE project will disseminate them to all MA educators – be professional! (*begin in week 4 of A-term, continue through B-term*)
 - i. Check each lesson for:
 - 1) Content – engineering design process, Worcester Public Schools (WPS) benchmarks, relevance to curriculum, implementation feedback, etc.
 - 2) Format – follow standard format (**location**) **exactly**
 - a. Number pages correctly based on grade and sequence (ex. 3.D. for the fourth (“D”) lesson in the third (“3”) grade binder) – each page in the 3.D. section should be numbered – (ex. 3.D.1., 3.D.2...3.D.12, if there were 12 pages).
 - b. Be aware of sequence of lessons: seasonality (fall/winter/spring) and holidays, as well as content sequence (ex. Oobleck 1 first, Oobleck 2 second, etc.)
 - 3) Language – use appropriate voice – 3rd person polite
 - a. Use: “teacher” or “instructor” as subject, person to whom instructions are directed
 - b. Use: “The teacher should consider asking students to raise hands...” or “The instructor should ask students to raise hands...”
 - c. Do **not** use: “You should ask students to raise hands...” or “Ask kids to raise hands...”
 - 4) Ensure that “student worksheets” or other “supplementary” pages included in each lesson plan do NOT have numbers – numbering may confuse grade 3 students: only the teacher’s pages of the lesson should contain numbers
 - 5) Enter correct data into tables on page 1 of all lessons, allowing organization of lessons by benchmark and seasonality
 - k. Send **perfect** lesson plans to “Curriculum Integration” IQP team (*begin week 4, A-term*)
- II. B-term

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- a. Rework and refine **Methodology** (*final form by end of B-term*)
 - b. Continue to review and edit lesson plans for your assigned grades (see I.g. through I.j., above) (*discuss appropriate progress with advisors, PIEE fellows*)
 - i. Send polished, perfect lesson plans to “Curriculum Integration” IQP Team – label correctly based on grade and sequence (*continued from week 4, A-term*)
 - c. Create new lessons (if relevant) as defined by your work team (your IQP team, MA teachers, WPI advisors, PIEE fellows) (*begin in B-term, continue throughout C-term*)
 - d. Continue to implement lessons and develop and implement kits in the classrooms (see I.i.) (*continue throughout C- and D-term, if relevant*)
 - e. Collect **Findings** – based on “Problem Statement” or Hypothesis – (ex. from assessment sheets, observation, etc.) (*continue throughout C-term*)
 - i. Organize into relevant, readable format (*create format before collecting data*)
 - f. Write working draft of **Results** section (*week 6*)
 - i. Short introductory paragraph
 - ii. Compilation and explanation of all quantitative/qualitative results to date
- III. C-term
- a. Continue to implement lessons and develop and implement kits in the classrooms (see I.i.) (*continue throughout D-term, if relevant*)
 - b. Continue to create new lessons (if relevant) as defined by your work team (your IQP team, MA teachers, WPI advisors, PIEE fellows)
 - c. Continue to revise, perfect, and organize lesson plans (*task nearly complete by end of C-term*)
 - d. Continue to send *perfect* lesson plans to “Curriculum Integration” IQP team (*continue throughout C- and D-term*)
 - e. Determine whether or not kits are self-sustaining (*finish by end of C-term*)
 - i. Make necessary changes to ensure sustainability
 - f. Write **Analysis of Findings** (of assessments, scores, interviews, etc.) (*final form by end of C-term, if appropriate – discuss with advisor*)
 - g. Write **Conclusions** based on **Analysis** and **Findings** (*final form by end of C-term*)
 - h. Write **Recommendations** based on **Conclusions** (*final form by end of C-term*)
 - i. Write **Abstract** (up to 80 words, strictly enforced) and **Executive Summary** (*less than 10% length of final document, but between 1-10 pages; final form by end of C-term*)
- IV. D-term
- a. Finish sending “perfect” lesson plans to “Curriculum Integration” IQP team – all lessons should be ready for general dissemination in MA (*finish by mid D-term*)
 - b. Finish creating and disseminating kits for appropriate lessons – include with kits:
 - i. Feedback forms for students/teachers
 - ii. A means by which grade 3 students can offer suggestions to improve the kit
 - c. Finish compiling grade 3 binder in paper and on CD: ensure that CD contains a *working* electronic Table of Contents
 - i. Distribute electronic and paper copies as determined by PIEE advisors and fellows
 - d. Complete and print final copy of IQP: include electronic versions (CDs) of all binders and other “products”
 - e. Thank your advisors; prepare to win President’s Award for Best IQP of 2005 – 2006