Secondary Science Program
NSTA Portfolio

Introduction to the Science Education Portfolio

I. **What is a portfolio?**
A portfolio is a collection of materials assembled to demonstrate to others what you have done and **are able to do**. It is a representation of you to others. This portfolio will need to represent you to the faculty and your near-future employers.

Your portfolio is a collection of documents (assignments, statements, letters, pictures, records, and research) that demonstrate to others that you have certain abilities and knowledge. Sometimes the material you use for your portfolio is a record of your performance when you successfully complete a teaching task. Sometimes it is a class paper/assignment showing that you have learned a particular concept or understand a particular issue. Sometimes it is a reflection on events that synthesizes, analyzes, or applies concepts to a situation you have not yet faced. It is a good idea to think of your portfolio as a set of materials especially assembled to showcase your work and your talents.

II. **What is the relationship of the portfolio to my classes?**
The portfolio is an evaluation that asks that you demonstrate your competencies in domains determined by our professional organizations through exemplars. These exemplars can come from any class or from material from your previous professional life or previous classes, though an emphasis on materials from student teaching is expected by the end of the year. This also means that you could pass a class assignment, but not pass when you present that same assignment in a portfolio meeting. The portfolio asks that you go beyond your assignments and synthesize your learning in line with identified (by the National Science Teachers Association) skills, understanding, and dispositions. The portfolio evaluation is a second layer of quality control that we use to determine your readiness for certification.

III. **How should I materially organize my portfolio**
A portfolio should be a collection that is easily stored, carried and shown. Traditionally we used three-ring binders. We use Google Sites to build our portfolio. On Sites you will need to load documents in a Matthew compatible format (.docx, .doc, pdf, jpg, .ppt, .pptx) and organize them on pages that mark broad portfolio categories. See http://faculty.washington.edu/mattheww/portfolio/index.html

Most items do not have obvious meanings to reviewers. You will need to provide commentary for reviewers explaining exactly what each element of the portfolio means in terms of the standards you are being judged by. This can be done through a cover webpage that explains the importance of the item to the skill being evaluated. Alternatively, the given item can be annotated using Microsoft Word comments or other markers.

The portfolio will have sections listed in part IV. Material demonstrating your skills are placed in each section along with a one page reflective statement explaining your choice of materials and a table of contents.

IV. **What are the sections of the NSTA Portfolio**
These are standards that the National Science Teachers Association (NSTA) has declared in which Preservice Teachers must show mastery before being credentialed as a teacher. A separate page will outline what elements from classes will form the key items in each section. Note that the items in each section are not fixed; you can use a variety of materials to document your proficiency in any given standard.

      Front material
1. Content knowledge
2. Context of Science
3. Research and Investigation (Inquiry)
4. Safety and Living Things
5. Planning
6. Assessment
7. Equity and Social Justice
8. Teaching Practices and Dispositions
9. Effects on Student Learning (TPA Essays and Student Work; no video)

      End material

V. **What does each section include?**
The front material includes your philosophy, a post-student teaching reflection on the changes in your philosophy, a professional growth plan, and a resume. Each section after the front material (with the exception of effects on student learning) starts with a section specific "expanded table of contents" (ETOC). This is one page that has an introduction to the section (your approach to that domain), and a list of items included in the section with a brief description of each (See ETOC example). These descriptions must emphasize the skills, knowledge or dispositions that the item demonstrates. The typical phrasing of the last sentence of the description is something like "This item demonstrates my ability to do _____." The end material includes any state documents, letters of support, or other materials needed to secure employment.

VI. **The presentation of the portfolio to the science education faculty and guest reviewers**
You will have to present your portfolio at different times in your license program; generally at the end of each quarter. There may be reasons for additional meetings, if, for instance, you have not passed a given standard of the portfolio. You always have the ability to resubmit materials to raise your score.

VII. **How is the portfolio evaluated?**
A rubric has been created for each standard in the portfolio. You will receive one of four possible scores: Excellent, Sufficient, Emerging and Insufficient. If you receive an *emerging* or *insufficient* you will be asked to do additional work, present additional information, or in some other way seek remediation before being permitted to proceed. Sufficient and excellent are both passing grades. After the fall,

winter and spring portfolio meetings you will receive an evaluation for the relevant sections (not all sections will be evaluated each quarter). These will be based on your presentation of materials from that section, your apparent knowledge of the theory and practice related to that portfolio section, and the relevant notebook section. You will also receive a separate holistic evaluation of your submitted notebook-portfolio. Your notebook will be evaluated based on the quality and alignment of your philosophy, ETOCs, and selected items. We will also be looking for appropriate revisions from quarter to quarter based on our feedback.

Safety and Living Things

In my classroom issues of safety and the respectful treatment of living organisms comes first. For science to be valued topic, the classroom must be safe. Physical and emotional safety is necessary for students to take the risks involved in inquiry, exploring controversial topics and learning itself. In my classroom I connect safety to ethical treatment of animals. Their safety is an extension of the safety of my students.

1. Classroom rules. Item 1 is a list of the classroom rules that introduced at the start of the year. Heavy emphasis is placed on respecting themselves, each other and all living things. These rules are reinforced regularly throughout the semester. This item demonstrates my ability to create reasonable safety rules in my classroom)

2. Safety contract. Because so much of my class uses inquiry and laboratory experimentation, students have to agree on strict rules of behavior as well as demonstrate basic safety operations in the classroom. This item demonstrates my ability to have students take responsibility for classroom safety.

3. Classroom layout. Because I want the classroom to be safe, I have designed the layout to keep objects such as book bags and coats out of the way. Notice that there is a coat rack which I built myself on the side of the classroom. This item demonstrates my ability to create a safe classroom environment.

Class Work as Portfolio Elements

For Fall and Winter Portfolio meetings the majority of elements will come from class assignments. The table below maps some of the potential assignments to the portfolio categories. For these assignments you will be issued a separate grade from the course grade indicating whether the item either is "Exemplary", "Meets standard", "Does not meet standard". See the rubrics for the criteria used to judge this work. Once a piece of work is Exemplary or Meets standard it can be included in the portfolio. The Evaluation should be included with the item.

Portfolio area	POTSS	Methods 1	Methods 2	Fieldwork	Other
1. Content				LP	West-E Scores
2. Context		Unit plan	WQ History LP Unit plan	LP	
3. R & I		Unit plan µ-Teaching Demonstration	CLP	LP	
4. Safety		Test MSDS Contract Class rules		LP	
5. Planning	Group LP	LP Unit plan	WQ CLP Unit plan		
6. Assessment	Rubrics		WQ	Samples	
7. Equity & Social Justice		Citizen Science LP	WQ, Issue Question, µ-Teaching		TEDUC 520: Community Walk/Ethnographic Interview Lessons

Key:

WQ = Webquest
LP = Lesson Plan
CLP = Community Lesson Plan

NOTE; Teaching practices and Effects on student learning come entirely out of the student teaching situation.

Portfolio Review Schedule

Your portfolio is developed over all of your pre-service coursework. Reviews will focus on particular elements as follows:

Review after...	Focus on...
POTSS	Philosophy 1. Content
Method 1	2. Research and Investigations 3. Safety 4. Planning
Method 2	5. Context 6. Assessment (you will present in order to get feedback, but evaluation will occur in spring) 7. Equity and Social Justice
Student teaching	All areas with special emphasis on... 6. Assessment 8. Teaching practices and dispositions 9. Effects on student learning (edTPA)

Note that Content and Teaching Practices and Dispositions receive continuous review in our program, with key evaluation points at admission to the program and portfolio reviews.

Portfolios and Student Teaching

The student teaching experience is the culmination of the certification process. At the end of student teaching you are expected to be strong novice teachers. Since the student teaching experience is your opportunity to display your skills as a teacher, there are lots of pieces of evidence that you need to add from your student teaching, but five are critical ones.

1. An inquiry lesson. This lesson must involve students in using process skills to explore a phenomenon and the nature of science.

2. An STS lesson. This lesson must explore applications of or social dilemmas related to science.

3. A unit (could include any of the above) that you analyze for effectiveness (see separate description of paper). This is done through the edTPA process. The entire packet (videos, etc.) of materials you submit for your edTPA should be included in effects in student teaching.

4. A list of ways you differentiated instruction

5. A list of ways you worked with parents, staff, and students outside of class time.

Miscellaneous other materials

Other elements you should include are any procedures you implemented for safety and classroom management, and any other exciting curriculum you taught.

Portfolio Checklists

Summer

Content
- ☐ Philosophy statement
- ☐ Short written statement about what your growth plan is for content knowledge

Fall

- ☐ ETOC for Content, R&I, Planning, Safety

Content
- ☐ Growth plan

Research and investigation
- ☐ Simple inquiry lesson plan
- ☐ Complex inquiry lesson plan

Planning
- ☐ Short lesson plan
- ☐ Unit plan

Safety
- ☐ Safety certificate
- ☐ MSDS certificate
- ☐ Safety contract
- ☐ Classroom rules

Winter

- ☐ ETOC for Context, Assessment, and Equity

Context

- ☐ Lesson engaging students in socio-scientific issues
- ☐ Lesson engaging students in history of science
- ☐ Lesson engaging students in an application of science

Assessment

- ☐ Formative assessment
- ☐ Summative assessment
- ☐ Authentic assessment

Equity and Social Justice

- ☐ Use of funds of knowledge
- ☐ Social justice lesson plan
- ☐ Authentic assessment

Spring

Front Material

- ☐ Add professional development plan and update ETOC
- ☐ Final reflection on how your philosophy has changed over the program (Addendum to philosophy)

Assessment (replace examples)

- ☐ Formative assessment from student teaching
- ☐ Summative assessment from student teaching
- ☐ Authentic assessment from student teaching
- ☐

Equity and Social Justice (Replace Examples)

- ☐ Use of funds of knowledge
- ☐ Social justice lesson plan
- ☐ Evidence of successful differentiation of instruction

Teaching practices (No top paragraph required on ETOC)

- ☐ Example of inquiry from student teaching
- ☐ Example of STS from student teaching
- ☐ Evidence of successful work with staff, parents and students beyond classroom setting

Effects on student learning

- ☐ TPA material

UWT Secondary Science Portfolio Review Rubric

Evaluation of the oral defense of the portfolio:

Standard	*Excellent*	*Sufficient*	*Insufficient*
1. Content		Forthcoming	
2: Context	The candidate demonstrates a complex, thorough, and integrated understanding of science's connection to social issues and the enterprise of science. S/he can design and conduct lessons and units that involve exploration of such issues in a manner appropriate for 7-12 students.	The candidate demonstrates an understanding of science's connection to social issues and the enterprise of science, however, the conception or application seems limited, disjointed or contradictory. S/he can design and conduct lessons and units that involve exploration of such issues in a manner appropriate for 7-12 students, but the implementation is not as broad as it might be (e.g., ignoring important facets of an issue) or in other minor ways is problematic.	The candidate fails to demonstrate an understanding of science's connection to social issues and the enterprise of science, however, the conception or application seems limited, disjointed or contradictory. It is not clear that s/he can design lessons exploring social issues regarding science.
3: Research and investigation	The candidate demonstrates a complex, thorough, and integrated understanding of the process, tenets and models of scientific inquiry. S/he can design, conduct and report research, and can use this knowledge to design inquiry units for 7-12 students.	The candidate demonstrates an understanding of the process, tenets and models of scientific inquiry, however, the conception or application seems limited, disjointed, or contradictory. S/he can design, conduct and report research, and can use this knowledge to design inquiry units for 7-12 students, but the implementation is not as developed as it might be, or in other minor ways is problematic.	The candidate fails to demonstrate an understanding of the process, tenets and models of scientific inquiry. The conception or application is limited, disjointed, or contradictory, and additionally incomplete. It is not clear that s/he can design, conduct and report research, or can use this knowledge to design inquiry units for 7-12 students, .

Standard	Excellent	Sufficient	Insufficient
4: Safety and living things	The candidate demonstrates a thorough understanding and ability to practice their legal and ethical responsibilities for the welfare of students including proper techniques for storage, dispensing, supervision, and disposal of all materials used in science instruction. S/he demonstrates that s/he can instruct and supervise students regarding safety, emergency procedures, and maintenance of equipment. S/he also demonstrates the ability to treat living creatures in a safe, humane, and ethical manner.	The candidate demonstrates an understanding and ability to practice their legal and ethical responsibilities for the welfare of students including proper techniques for storage, dispensing, supervision, and disposal of all materials used in science instruction. S/he demonstrates that s/he can instruct and supervise students regarding safety, emergency procedures, and maintenance of equipment. S/he also demonstrates the ability to treat living creatures in a safe, humane, and ethical manner. However, the demonstration or commitment to safety may seem more fragmentary, in ways that are not dangerous to themselves or their students.	The candidate fails to demonstrates an understanding and ability to practice their legal and ethical responsibilities for the welfare of students including proper techniques for storage, dispensing, supervision, and disposal of all materials used in science instruction. S/he may also fail to demonstrate that s/he can instruct and supervise students regarding safety, emergency procedures, and maintenance of equipment. S/he may also fail to demonstrate the ability to treat living creatures in a safe, humane, and ethical manner. However, the demonstration or commitment to safety may seem more fragmentary, in ways that are not dangerous to themselves or their students.
5: Planning	The candidate demonstrates that they understand how to identify, access, and create appropriate activities for students consistent with the NSES standards. They can plan both individual lessons and longer units reflecting these standards.	The candidate demonstrates that s/he understands how to identify, access, and create appropriate activities for students consistent with the NSES standards. S/he can plan both individual lessons and longer units reflecting these standards. However, while s/he is able to produce NSES based lessons, they are fragmented rather than integrated.	The candidate fails to demonstrate that s/he understands how to identify, access, and create appropriate activities for students consistent with the NSES standards. This may mean a lack of inquiry or any other strand of the standards. The plans themselves may also be problematic in any number of ways that raise questions of their ability to anticipate creating an effective environment for their students.

Standard	Excellent	Sufficient	Insufficient
6. Assessment	The candidate demonstrates that they understand how to assess student understanding using a wide variety of tools that stress multiple levels of understanding, authentic as well as traditional approaches. Assessments are designed so that feedback is meaningful, e.g., through rubrics. S/he also integrates assessment throughout the learning process including diagnostic, formative, and summative assessments. S/he also uses assessment to modify instruction.	The candidate demonstrates that they understand how to assess student understanding using a wide variety of tools that stress multiple levels of understanding. S/he also integrates assessment at times (though not continuously) through the learning process including formative, and summative assessments and uses the results to modify instruction, however, the modifications do not differentiate instruction or are not as responsive as the assessments indicate are needed. The assessments may also have flaws in their design, in terms of content covered, or the meaning of scores.	The candidate fails to demonstrate that they understand how to assess student understanding. They rely at best on a few very traditional instruments that require little or low levels of understanding. Alternatively, assessments are only used as summative instruments. Alternatively, the instruments may have severe design flaws in terms of objectives, scoring, or content.

Standard	Excellent	Sufficient	Insufficient
7. Equity and Social Justice	The candidate demonstrates an ability to implement instruction and assessment that considers students' cultural funds of knowledge, issues of social justice, and that addresses issues of equity as they relate to race, culture, economics, sexual identity, sexual preference, and disabilities. This level of demonstration also reflects on the candidate's ability to construct curriculum that engages students in issues of environmental or social justice. This engagement involves students exploring agency in addressing such issues.	The candidate demonstrates an understanding of instruction and assessment that considers students' cultural funds of knowledge, issues of social justice, and that addresses issues of equity as they relate to race, culture, economics, sexual identity, sexual preference, and disabilities. This level of demonstration also reflects on the candidate's ability to construct curriculum that engages students in issues of environmental or social justice, though it may not have students explore agency in addressing such issues.	The candidate fails to demonstrate that they understand instruction or assessment in relation to students' cultural funds of knowledge, issues of social justice; they fail to address issues of equity as they relate to race, culture, economics, sexual identity, sexual preference, or disabilities. There is no evidence of addressing social justice either through academic study or explorations of agency.

Standard	Excellent	Sufficient	Insufficient
8. Teaching practices and dispositions	The candidate demonstrates that they understand how to design instruction appropriate to the heterogeneous nature of student learners and in line with standards and values in the profession (including STS and inquiry). S/he demonstrates that s/he can act as an advocate for diverse communities of students, and as both a member and leader in the educational community (which includes students, staff, parents, colleagues, and administration).	The candidate demonstrates that they understand how to design instruction appropriate to the heterogeneous nature of student learners and in line with standards and values in the profession (including STS and inquiry, though the candidate has clear biases which limit their ability to integrate them into their curriculum). The candidate also demonstrates that s/he can work effectively with the members of the educational community, including students, staff, parents, colleagues, and administration.	The candidate fails to demonstrate that they understand how to design instruction appropriate to the heterogeneous nature of student learners. Their teaching is not in line with the standards and values in the profession. Alternatively, the candidate demonstrates that s/he is incapable of working effectively with the members of the educational community, including students, staff, parents, colleagues, or administration.

Notebook evaluation

Standard	Excellent	Sufficient	Insufficient
Notebook	Strong alignment of philosophy, ETOC[1]'s lead paragraph and selection and description of included items. ETOC paragraphs address the role of the topic of the section and distinguish the candidate's approach to the topic. ETOC items are well selected and indicate what skills, knowledge or dispositions the item demonstrates. Items themselves are well annotated with a cover page or post-its to point out the significant aspects of the item. The notebook is neat, sections are easy to identify, the ETOCs are consistently and helpfully formatted with ETOC items bulleted or enumerated. The items are bundled for easy access. All relevant items are present. Over time items have been revised based upon feedback.	There is a clear alignment between philosophy, ETOCs, and selected items. The connection may be vague at times, but there is a connection. ETOC paragraphs identify strengths and approaches. There may be a need to develop the paragraphs more, but a foundation is clear. ETOC items are inconsistently selected, perhaps too many or too few items are selected. There is inconsistent identification of skills, knowledge or dispositions that the items demonstrate. Items themselves are inconsistently annotated, or appropriate annotation may be missing, but the items are there. The notebook is neat. There may be problems finding sections, ETOCs may have slight inconsistencies or problems in formatting, items are bulleted, accessing individual items may be somewhat difficult All relevant items are present. There is some evidence of attempting to revise the notebook based on feedback.	There is either absent alignment or contradictory alignment between philosophy, ETOCs, and selected items. ETOC paragraphs do not identify strengths and personal approaches. ETOC items do not identify the skills, knowledge or dispositions that the items demonstrate. Items are not appropriately selected or giant wholes are present in the materials that are included. There The notebook is sloppily assembled. The order and access are problematic. Sections are difficult to find. Formatting is very difficult to read or to follow. Many formatting inconsistencies that detract from the usefulness of the notebook. ETOC items are not distinguished through bulleting or enumeration. Relevant items are missing. Despite problems and feedback, no attempt has been made to revise the notebook over time.

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[1] ETOC – Annotated Table of Contents: the cover page to each section which starts with a description of your approach to the portfolio category and then describes the items that demonstrate your skills within that category.

Candidate Name: Date:

Instructions: Assess your experiences related to the three Professional Certificate standards and 12 criteria. Target three criteria for which professional development is needed in order to meet standard. For each **targeted** criterion, propose growth activities, possible resources you will use to complete the activities, and the month/year in which you plan to complete the activities.

Standard 1	A successful candidate for the teacher professional certificate shall demonstrate the knowledge and skills for <u>effective teaching </u>which ensure student learning by:				
Criteria		**Selected Target**	**Proposed Growth Activities** Include area of focus, rationale for choosing this target, and anticipated impact on student learning	**Possible Resources**	**Complete By**
(a) Using instructional strategies that make the learning meaningful and show positive impact on student learning.		☐			
(b) Using a variety of assessment strategies and data to monitor and improve instruction.		☐			
(c) Using appropriate classroom management principles, processes and practices to foster a safe, positive, student-focused learning environment		☐			
(d) Designing and/or adapting challenging curriculum that is based on the needs of each student.		☐			
(e) Demonstrating cultural sensitivity in teaching and in relationships with students, parents, and community members.		☐			
(f) Integrating technology into instruction and assessment.		☐			
(g) Informing, involving, and collaborating with families and community as members as partners in each student's educational process, including using information about student achievement and performance.		☐			

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Standard 2	A successful candidate for the teacher professional certificate shall demonstrate the knowledge and skills for <u>professional development</u> by:				
Criteria		**Target**	**Proposed Growth Activities** Include area of focus, rationale for choosing this target, and anticipated impact on student learning	**Possible Resources**	**Complete By**
(a) Evaluating the effects of his/her teaching through feedback and reflection.		☐			
(b) Using professional standards and district criteria to assess professional performance, and plan and implement appropriate growth activities.		☐			
(c) Remaining current in subject area(s), theories, practice, research, and ethical practice.		☐			

Standard 3	A successful candidate for the professional certificate shall demonstrate <u>professional contributions</u> to the improvement of the school, community, and the profession by:				
Criteria		**Target**	**Proposed Growth Activities** Include area of focus, rationale for choosing this target, and anticipated impact on student learning	**Possible Resources**	**Complete By**
(a) Advocating for curriculum, instruction, and learning environments that meet the diverse needs of each student.		☐			
(b) Participating collaboratively in school improvement activities and contributing to collegial decision-making.		☐			

Date: _____

_____
Residency Teacher Candidate Signature

Rev 04-2006