

Environmental Science Literacy Project

Consent Forms and Letters of Permission

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PARTICIPATION LEVEL 1: RESEARCHERS HAVE ACCESS ONLY TO DE-IDENTIFIED DATA; STUDENT IDENTITY UNKNOWN; We have been granted a waiver of parental consent for this participation level.

1. *Teacher online consent-* for teachers only using science content assessments and sharing de-identified student data

Dear Teacher,

You are invited to participate in the Environmental Science Literacy Project—a project that aims to develop research-based learning progressions for carbon cycling. It involves giving your students pre- and post-assessments on science topics. You also have the option of using curriculum materials designed by researchers, although this is not required in order to participate in the study. The pre- and post-assessments will allow researchers an opportunity to explore how students understand conceptual issues related to topics taught by you. In addition, the researchers may collect information about students' performance on other assessments (e.g., standardized assessments). Since ID numbers will be used to coordinate assessment data from different sources, the researchers will not know the identities of participating students.

The researchers may also ask you to respond to questionnaires about your science teaching practices, including questions about your understanding of the science content you are teaching, the lessons you taught and your approaches to teaching those lessons, your evaluations of teaching materials and professional development activities, and people in your professional networks and how you work with them.

Participation in this study will help researchers and teachers develop better science curriculum materials. This will provide benefit to many students and teachers beyond those directly participating in the project. Additionally, participation in this study will allow you to interact with teacher education faculty and graduate students around your teaching and provide you with a valuable professional development opportunity.

There are minimal risks associated with this study. You may choose to have your participation in this project remain confidential and your confidentiality will be protected to the maximum extent allowable by law. Researchers will use pseudonyms and disguise personal identifiers in any written reports, publications, and presentations. You may also choose to be acknowledged by name as a contributor to this project, and in that way you may waive your right to confidentiality. You are not required to be acknowledged as a contributor, and thus are not required to waive your confidentiality rights.

You may discontinue your participation in this project at any time during the project period (February 2015-August 2016) without penalty. Participation is voluntary, you may choose not to participate at all, or you may refuse to participate in certain procedures or answer certain questions or discontinue your participation at any time without consequence. Your refusal to participate or decision of discontinuing the participation will involve no penalty or loss of benefits to which you are otherwise entitled.

Data from this study may be used in reports, articles, presentations, and in teacher education classes. Some data may be used in teacher support materials for units designed for the Environmental Science Literacy Project. You have the right to read prior to publication any report materials that describe you to assure your identity is adequately disguised or acknowledged (according to your choice). You have the right to review any materials that describe you before they are used in teacher support materials. After this review, you may deny permission to use those materials.

Your confidentiality will be protected to the maximum extent allowable by law. The data will be stored on secure servers at Colorado State University in Fort Collins, CO for at least 3 years after project closes. The project investigators will have access to the data for research purposes. At Michigan State University, an Institutional Review Board (IRB) reviews all research studies that involve human subjects before the research can be started. Their mission is to protect the rights of research participants. IRB will have access to the research data and results.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), please contact Dr. Charles W. (Andy) Anderson, 319A Erickson Hall, Michigan State University, East Lansing MI 48824, (517) 432-4648, andya@msu.edu.

If you have any questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this research study, you may contact, anonymously if you wish, the Michigan State University Human Research Protection Program at 517-355-

2180, FAX 517-432-4503, or e-mail irb@msu.edu, or regular mail at: 207 Olds Hall, MSU, East Lansing, MI 48824.

By choosing "I accept" at the bottom of the page, you indicate voluntary agreement to participate in this study.

2. *Student assent letter*- for students taking paper-pencil assessments with student identity unknown to researchers.

Dear Student:

You are invited to participate in the *Environmental Science Literacy Project* undertaken by teachers and students at Michigan State University. You will be asked to participate in research about science, and if you choose to participate, your answers will be shared with researchers. Your school may also share other information about you and your classmates, such as scores on other assessments.

Your participation in this study will help teachers learn about effective ways to teaching science. This will provide benefits to many students and teachers beyond those directly participating in the project. You may benefit from participating in this project by having the opportunity to have your ideas recognized and valued by others.

Your teacher can require you take this assessment and give you a grade for your answers, but you are not required to share your answers with researchers. Your teacher will not use the researchers' findings to give you grades, though teachers may grade your work themselves. You will not receive any extra credit if you choose to participate in the study, and you will not lose credit if you choose not to participate in the study.

There are minimal risks involved in participating. Your confidentiality will be protected so MSU researchers who see your work, or any information about you, will not know your real name.

Your participation in this project is completely voluntary. You may choose not to participate at all, or you may refuse to answer certain questions or discontinue your participation at any time during the project period (August 2015- June 2016) without consequence. Your refusal to participate or decision of discontinuing the participation will involve no penalty or loss of benefits to which you are otherwise entitled.

Your confidentiality will be protected to the maximum extent allowable by law. The data will be stored in locked filing cabinets at 319A Erickson Hall, East Lansing, MI and on secure servers at Colorado State University in Fort Collins, CO for at least 3 years after project closes. The project investigators will have access to the data for research purposes. At Michigan State University, an Institutional Review Board (IRB) reviews all research studies that involve human subjects before the research can be started. Their mission is to protect the rights of research participants. IRB will have access to the research data and results.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), please contact Dr. Charles W. (Andy) Anderson, 319A Erickson Hall, Michigan State University, East Lansing MI 48824, (517) 432-4648, andya@msu.edu.

If you have any questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this research study, you may contact, anonymously if you wish, the Michigan State University Human Research Protection Program at 517-355-2180, FAX 517-432-4503, or e-mail irb@msu.edu, or regular mail at: 207 Olds Hall, MSU, East Lansing, MI 48824.

If you agree to participate in this research project, please print and sign your name below.

I voluntarily agree to participate in this study.

Print Name _____

Sign Name _____

Date: _____

3. *Student waiver of documentation for online assessments-* for students taking online assessments with student identity unknown to researchers.

Dear Student:

You are invited to participate in the *Environmental Science Literacy Project* undertaken by teachers and students at Michigan State University. You will be asked to participate in research about science, and if you choose to participate, your answers will be shared with researchers. Your school may also share other information about you and your classmates, such as scores on other assessments.

Your participation in this study will help teachers learn about effective ways to teaching science. This will provide benefits to many students and teachers beyond those directly participating in the project. You may benefit from participating in this project by having the opportunity to have your ideas recognized and valued by others.

Your teacher can require you take this assessment and give you a grade for your answers, but you are not required to share your answers with researchers. Your teacher will not use the researchers' findings to give you grades, though teachers may grade your work themselves. You will not receive any extra credit if you choose to participate in the study, and you will not lose credit if you choose not to participate in the study.

There are minimal risks involved in participating. Your confidentiality will be protected so researchers who see your work, or any information about you, will not know your real name.

Your participation in this project is completely voluntary. You may choose not to participate at all, or you may refuse to answer certain questions or discontinue your participation at any time during the project period (August 2015- June 2016) without consequence. Your refusal to participate or decision of discontinuing the participation will involve no penalty or loss of benefits to which you are otherwise entitled.

Your confidentiality will be protected to the maximum extent allowable by law. The data will be stored on secure servers at Colorado State University in Fort Collins, CO for at least 3 years after project closes. The project investigators will have access to the data for research purposes. At Michigan State University, an Institutional Review Board (IRB) reviews all research studies that involve human subjects before the research can be started. Their mission is to protect the rights of research participants. IRB will have access to the research data and results.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), please contact Dr. Charles W. (Andy) Anderson, 319A Erickson Hall, Michigan State University, East Lansing MI 48824, (517) 432-4648, andya@msu.edu.

If you have any questions regarding your role and rights as a study participant, or would like to register a complaint about this research study, you may contact, anonymously if you wish, the Human Research Protection Program, at 517-355-2180, Fax 517-432-4503, or email irb@msu.edu, or regular mail at HRPP, 207 Olds Hall, MSU, East Lansing, MI 48824.

By hitting the "Accept" button at the bottom of the page, you indicate voluntary agreement to participate in this study, which means your responses to the following questions may be shared with researchers.

4. *Administrator permission letter*- for administrators in K-12 schools who have teachers participating in providing de-identified student data.

Date: _____

School Name: _____

School Address: _____

Charles W. Anderson
Department of Teacher Education
Michigan State University
319A Erickson Hall
East Lansing, MI 48824

Dear Dr. Anderson,

I consent to science teachers in my school participating in the study: Learning Progressions in Environmental Science Literacy.

I understand that teachers who participate will be using curriculum materials designed to teach specific aspects of carbon cycling--topics that are included in the teachers' regular science curricula. The data collected in this study will allow researchers an opportunity to explore the effectiveness of curriculum materials and how students understand science topics. The teachers will be using assessments developed to accompany the materials, including pre- and post-tests and embedded assessment activities. Researchers will have access only to de-identified data, so that the names of students will not be known to the researchers. In addition, standardized test scores may be collected. Student ID numbers will be used to coordinate the assessment data and demographic information.

I also understand that every effort will be made to protect the identity of teachers, students, and the school involved in the study. The data collected from this study will remain confidential and the privacy of participating individuals will be protected, for example, by keeping the data in a secure location only accessible by researchers and Institutional Review Board members and using pseudonyms or ID numbers and disguising personal identifiers in written reports and presentations.

Sincerely,

_____ Name of administrator

_____ Signature

PARTICIPATION LEVEL 2: ASSESSMENT, CLASSROOM WORK, AUDIO/VIDEO IDENTITY KNOWN

5. *Teacher consent*- for teachers administering pre and post assessments, using curriculum materials, copying student work for researchers, and participating in or having students

Dear Teacher:

You are invited to participate in the *Environmental Science Literacy Project*—a project that aims to develop research-based learning progressions for carbon cycling. It involves giving your students pre- and post-assessments, using curriculum materials designed by researchers, sharing copies of student work, sharing other information about students (such as standardized test scores), and audio or video taping your instruction or interviews with you or your students. The researchers may also observe and take notes during your class instruction.

The researchers may also ask you questions that will help them understand your science teaching practices through questionnaires or interviews, including questions about your understanding of the science content you are teaching, the lessons you taught and your approaches to teaching those lessons, your evaluations of teaching materials and professional development activities and people in your professional networks and how you work with them.

The data collected in this study will allow researchers an opportunity to explore the effectiveness of curriculum materials and how students understand science topics. Participation in this study will help researchers and teachers develop better science curriculum materials. This will provide benefit to many students and teachers beyond those directly participating in the project. Additionally, participation in this study allows you to interact with teacher education faculty and graduate students around your teaching and provides you with a valuable professional development opportunity.

There are minimal risks associated with this study. However, you may be visible and identifiable in audio or videotapes. If you choose to have your participation in this project remain confidential, every effort will be made to protect the confidentiality of information about you, for example, by keeping materials in secure locations only accessible by researchers and Institutional Review Board members and using pseudonyms and disguising personal identifiers in any written reports, publications, and presentations. Your confidentiality will be protected to the maximum extent allowable by law. You may also choose to be acknowledged by name as a contributor to this project, and in that way you may waive your right to confidentiality. You are not required to be acknowledged as a contributor, and thus are not required to waive your confidentiality rights.

Participation time will vary, but may be as much as 40 hours across a school year. You will be compensated for your time spent on this project outside your regular teaching responsibility. You may discontinue your participation in this project at any time during the project period (February 2015- August 2016) without penalty. Participation is voluntary; you may choose not to participate at all, or you may refuse to participate in certain procedures or answer certain questions or discontinue your participation at any time without consequence. Your refusal to participate or decision of discontinuing the participation will involve no penalty or loss of benefits to which you are otherwise entitled.

The data from this study may be used in reports, articles, presentations, and in teacher education classes. Some data may be used in teacher support materials for units designed for the Environmental Science Literacy Project. You have the right to read prior to publication any reports that describe you to assure that your identity is adequately disguised or acknowledged (according to your choice). You have the right to review any materials that describe you or recordings of you before they are used in written reports or presentations. After this review, you may deny permission to use those materials.

Your confidentiality will be protected to the maximum extent allowable by law. The data will be stored in locked filing cabinets at 319A Erickson Hall, East Lansing, MI and on secure servers at Colorado State University in Fort Collins, CO for at least 3 years after project closes. The project investigators will have access to the data for research purposes. At Michigan State University, an Institutional Review Board (IRB) reviews all research studies that involve human subjects before the research can be started. Their mission is to protect the rights of research participants. IRB will have access to the research data and results.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), please contact Dr. Charles W.

(Andy) Anderson, 319A Erickson Hall, Michigan State University, East Lansing MI 48824, (517) 432-4648, andya@msu.edu.

If you have any questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this research study, you may contact, anonymously if you wish, the Michigan State University Human Research Protection Program at 517-355-2180, FAX 517-432-4503, or e-mail irb@msu.edu, or regular mail at: 207 Olds Hall, MSU, East Lansing, MI 48824.

Your initials give voluntary permission for you and your students to participate in the activities you have indicated below (PLEASE INITIAL EACH LINE YOU APPROVE):

- _____ The researchers may observe your students during science class, using notes to keep track of interactions.
- _____ The researchers may audio and/or videotape science lessons or may ask you to do so.
- _____ The researchers may or ask you to interview the students about their learning in science class or may ask you to do so. This will take place at a time that is judged educationally sound by the teacher. Interviews will be approximately 30 minutes long and be audio or video-recorded. If interviews are arranged with the student either before or after school, the student will be compensated with a gift card or cash.
- _____ The researchers may keep copies of the students' written work in science (including pre- and post-assessments and classroom work). These documents will be held in confidence. Any examples of the students' work that appear in any publication will have the students' identity disguised.
- _____ The researchers may ask you questions about your science teaching practices through questionnaires or interviews, including questions about your understanding of the science content you are teaching, the lessons you taught and your approaches to teaching those lessons, and your evaluations of teaching materials and professional development activities.

Your signature below means that you voluntarily agree to participate in this research study.

Teacher's consent _____ Date _____

6. *Administrator consent*- for administrators who are interviewed about how they support teachers in their school who are using innovative teaching materials.

Dear Administrator,

You are being asked to participate in a case study research project. The larger *Carbon TIME* Project aims to improve science teaching with research-based teaching materials and assessments, professional development, and professional support networks. We aim to better understand teachers' implementation of research-based teaching strategies, particularly those related to learning progressions, so that we can offer recommendations to improve teacher professional development and to better support student learning.

If you decide to participate, we will ask to interview you during the 2015-016 academic year. The interview will last about 30 minutes and will be digitally recorded. We will ask questions about your school's priorities, its structure, the kinds of instructional support available to teachers, the kinds of professional development opportunities provided to them, and connections across the school, students' parents, and local community.

Risks involved with participating in this project are minimal. To help minimize discomfort from the interview, it will be scheduled at a time most convenient to you.

Our research results will be reported to the funding agency, the National Science Foundation, and in scholarly publications and presentations. We will assign you and the teachers and school(s) you work with pseudonyms. Identifiable information about you will not be used in any reports, presentations, or publications without your consent. .

You may refuse to participate in this study. You may change your mind about being in the study and quit after the study has started.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), please contact Dr. Charles W. (Andy) Anderson, 319A Erickson Hall, Michigan State University, East Lansing MI 48824, (517) 432-4648, andya@msu.edu.

Participation in research is voluntary. Your signature below will indicated that you have decided to participate in this research.

Signature of Administrator: _____ Date: _____

8. *Parent consent:* Information letter and consent for parent with a child participating in study where identity of child is known to researchers.

Dear Parent or Guardian:

Your son/daughter is invited to participate in the *Environmental Science Literacy Project*—a research project that aims to develop research-based materials for teaching about the carbon cycle, a topic that is already included in your school's regular science curriculum.

Participation in the project involves having your child complete pre- and post assessments on this topic. Your child may participate in an audio or videotaped interview with researchers about his or her learning in science class. The researchers may also observe and/or videotape your child's classroom, and writing samples (e.g., class assignments) may be photocopied for the study. Your child's school may share other information about your child and his/her classmates, such as standardized test scores..

The data collected in this study will allow researchers an opportunity to explore the effectiveness of materials for teaching about the carbon cycle. This will provide benefit to many students and teachers beyond those directly participating in the project. Students participating in this type of study may benefit from increased opportunity to have their ideas recognized and valued by adults, thus increasing students' self-esteem and their engagement in learning.

Participation in the study will not affect your child's grade—your child will not receive extra credit if you choose for your child to participate, nor will your child lose credit if you choose for your child not to participate. Your child will not be required to spend extra time outside of class for the purposes of this study except for the possibility of an interview. Students will be compensated with a gift card or cash if the student participates in an interview outside of regularly scheduled class time.

There are minimal risks associated with this study. Data from the study may be used in reports, articles, presentations, and in teacher education classes or teacher support materials. Your child's confidentiality will be protected to the maximum extent allowable by law. A pseudonym for your child will be used in any written or oral reports about this work. Your child's identity may be recognizable in videotapes or photographs of classroom lessons or interviews even though pseudonyms will be used to protect his/her identity. You may choose to have any segment of videotape or photograph in which your child is identifiable not used in the study or in products or presentations. Students expressing discomfort with being videotaped will not be included in the videotaping. The researchers will strictly observe confidentiality procedures and all information about your child's identity will be kept in a secure location in the researchers' custody and only accessible by MSU researchers and Institutional Review Board members.

Your son/daughter's participation in this project is completely voluntary. You are free to withdraw your permission for his/her participation at any time and for any reason during the project period (August 2015- June 2016). Additionally, we will ask each child to also provide his/her assent for participation.. He/she is free to refuse to share any of their work with the researchers at any time. A copy of the research results after this project is completed will be given to you at your request. Your decision not to participate or decision to discontinue the participation will involve no penalty or loss of benefits to which you are otherwise entitled.

Your confidentiality will be protected to the maximum extent allowable by law. The data will be stored in locked filing cabinets at 319A Erickson Hall, East Lansing, MI and on secure servers at Colorado State University in Fort Collins, CO for at least 3 years after project closes. The project investigators will have access to the data for research purposes. At Michigan State University, an Institutional Review Board (IRB) reviews all research studies that involve human subjects before the research can be started. Their mission is to protect the rights of research participants. IRB will have access to the research data and results.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), please contact Dr. Charles W. (Andy) Anderson, 319A Erickson Hall, Michigan State University, East Lansing MI 48824, (517) 432-4648, andya@msu.edu.

You have read about the goals of this project and the nature of your child's participation in it. Please read the options described below, initial the options for which you give consent for your child's participation, and sign

and return the form to your child's classroom teacher. While the science topics under study are part of the regular class curriculum, participating in the research aspects (sharing their work, video & audio taping, and interview) is voluntary.

Your initials give voluntary permission for your child to participate in the activities you have indicated below (PLEASE INITIAL EACH LINE YOU APPROVE):

- _____ The researchers may observe your child during science class, using notes to keep track of interactions.

- _____ The researchers may audio and/or videotape science lessons involving your child.

- _____ The researchers may interview your child about his or her learning in science class. This will take place at a time that is judged educationally sound by the teacher. Interviews will be approximately 30 minutes long and be audio or video-recorded. If interviews are arranged with you and your child either before or after school, your child will be compensated with a gift card.

- _____ The researchers may keep copies of your child's written work in science (including pre- and post-assessments and classroom work). These documents will be held in confidence. Any examples of your child's work that appear in any publication will have your child's identity disguised.

I voluntarily agree to allow my child to participate in this study.

Child's Name _____

Parent/Guardian's Name _____
(please print)

Parent/Guardian's Signature _____ Date _____

9. *Student assent*: Student assent where identity is known to researchers

Dear Student:

You are invited to participate in the *Environmental Science Literacy Project* undertaken by teachers and students at Michigan State University. As part of the research project, you will be asked to participate in science assessments and your answers may be shared with researchers. Your teacher may also share other information about you, such as scores you've received on other assessments, and copies of your classroom work. The researchers may videotape parts of your class and the researchers may want to interview you. If you participate in an interview, it will happen during regular school hours and will take about 30 minutes. If the interview happens before or after school, you will receive a gift card or cash.

Your participation in this study will help teachers learn about effective ways to teaching science. This will provide benefits to many students and teachers beyond those directly participating in the project. You may benefit from participating in this project by having the opportunity to have your ideas recognized and valued by others.

Your teacher will not use the researchers' findings to give you grades. You will not receive any extra credit if you choose to participate in the study, and you will not lose credit if you choose not to participate in the study.

There are minimal risks involved in participating. Your confidentiality will be protected so that no one who sees your work will know your real name. We will use a pseudonym (fake name) or number ID to disguise your real name. If you do not want to be videotaped or audio recorded, we will not include you in the recordings. The audio and videotapes will be used only by the researchers and kept in a secure location at the researchers' office.

Your participation in this project is completely voluntary. You are free to withdraw your participation or refuse to share your answers with to any questions on the assessments with researchers without penalty. Your refusal to participate or decision of discontinuing the participation will involve no penalty or loss of benefits to which you are otherwise entitled.

Your confidentiality will be protected to the maximum extent allowable by law. The data will be stored in locked filing cabinets at 319A Erickson Hall, East Lansing, MI or on secure servers at Colorado State University in Fort Collins, CO for at least 3 years after the closes. The project investigators will have access to the data for research purposes. At Michigan State University, an Institutional Review Board (IRB) reviews all research studies that involve human subjects before the research can be started. Their mission is to protect the rights of research participants. IRB will have access to the research data and results.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), please contact the principal investigator: Dr. Charles W. (Andy) Anderson, 319A Erickson Hall, Michigan State University, East Lansing MI 48824, (517) 432-4648, andy@msu.edu.

Your initials give voluntary permission for your students to participate in the activities you have indicated below (PLEASE INITIAL EACH LINE YOU APPROVE):

- _____ The researchers may observe you during science class, using notes to keep track of interactions.
- _____ The researchers may audio and/or videotape science lessons.
- _____ The researchers may interview you about your learning in science class. This will take place at a time that is judged educationally sound by the teacher. Interviews will be approximately 30 minutes long and be audio or video-recorded. If interviews are arranged with you either before or after school, you will be compensated with a gift card.
- _____ The researchers may keep copies of your written work in science

(including pre- and post-assessments and classroom work). These documents will be held in confidence. Any examples of your work that appear in any publication will have your identity disguised.

If you agree to participate in this research project, please print and sign your name below.

I voluntarily agree to participate in this study.

Print Name _____

Sign Name _____

Date: _____

10. *Administrator permission letter*- for administrators who have teachers and students participating in more inclusive data collection where student identity may be known to researchers

Date: _____

School Name: _____

School Address: _____

Charles W. Anderson
Department of Teacher Education
Michigan State University
319A Erickson Hall
East Lansing, MI 48824

Dear Dr. Anderson,

I consent to science teachers in my school participating in the study: Sustaining Responsive and Rigorous Teaching Using *Carbon TIME*.

I understand that teachers who participate will be using curriculum materials designed to teach specific aspects of carbon cycling--topics that are included in the teachers' regular science curricula. The data collected in this study will allow researchers an opportunity to explore the effectiveness of curriculum materials and how students understand science topics. The teachers will be using assessments developed to accompany the materials, including pre- and post-tests and embedded assessment activities. In addition, the teachers' classroom instruction may be videotaped and audio recorded. The researchers' may conduct audio or video-recorded interviews with teachers and may conduct audio or video-recorded interviews with students whose parents' have given their signed consent. Some of students' writing samples (e.g. journals and class assignments) may be photocopied for the study. In addition, standardized test scores may be collected. Student state ID numbers will be used to coordinate the assessment data and demographic information.

I also understand that every effort will be made to protect the identity of teachers, students, and the school involved in the study. The data collected from this study will remain confidential and the privacy of participating individuals will be protected, for example, by keeping the data in a secure location only accessible by researchers and Institutional Review Board members and using pseudonyms or ID numbers and disguising personal identifiers in written reports and presentations.

I understand that if I have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), I can contact the project's principal investigator: Dr. Charles W. (Andy) Anderson, 319A Erickson Hall, Michigan State University, East Lansing MI 48824, (517) 432-4648, andya@msu.edu.

Sincerely,

_____ Name of administrator

_____ Signature

PARTICIPATION LEVEL 3: ADULT (18 OR OLDER)

11. Adult Consent age 18 and older (with compensation outside of class)

Dear Participant:

You are invited to participate in the *Environmental Science Literacy Project*—a research project that aims to develop learning progressions for carbon cycling and sustainability. Learning progressions describe how knowledge about a topic changes over time. Participation in the project involves taking written assessments on science topics and/or audio or videotaping an interview with you about your understanding of science concepts. The interviews may be scheduled at a time most convenient for you, and the interviews must be audio or videotaped in order to participate in this aspect of the study. The written assessments may take up to 30-40 to complete and the interviews will last approximately 30-40 minutes.

Your participation in this study will help teachers learn about effective ways to teaching science. This will provide benefits to many students and teachers beyond those directly participating in the project. You may benefit from participating in this project by having the opportunity to have your ideas recognized and valued by others.

You will be compensated with a gift card or cash if you participate in an interview or in a written assessment outside of class time. If you decide to participate in the study, you have the option of participating in either the interview or written assessment, or both. The compensation will be given to you upon the completion of the interview and/or assessment.

There are minimal risks associated with this study. Data from the study may be used in reports, articles, presentations, and in teacher education classes or teacher support materials. Your confidentiality will be protected to the maximum extent allowable by law. A pseudonym will be used in any written or oral reports about this work. Your identity may be recognizable in videotapes of interviews even though pseudonyms will be used to protect your identity. You may choose to have any segment of videotape in which you are identifiable not used in the study or in products or presentations. If you express discomfort with being videotaped, you will be audio taped instead. The researchers will strictly observe confidentiality procedures and all information about your identity will be kept in a secure location in the researchers' custody and only accessible by MSU researchers and Institutional Review Board members.

Your participation in this project is completely voluntary. You are free to withdraw participation at any time and for any reason without penalty during the project period (June 2015- August 2016). There will be no penalty to you if you choose not to participate. You are free to refuse to answer any questions you do not wish to answer. The information that is obtained during this research project will be kept strictly confidential. The audio and videotapes will be used only by the investigators and will be kept in a secure location in the researcher's custody. A copy of the research results after this project is completed will be given to you at your request. Your refusal to participate or decision of discontinuing the participation will involve no penalty or loss of benefits to which you are otherwise entitled.

Your confidentiality will be protected to the maximum extent allowable by law. The data will be stored in locked filing cabinets at 319A Erickson Hall, East Lansing, MI or on secure servers at Colorado State University in Fort Collins, CO for at least 3 years after the project closes. The project investigators will have access to the data for research purposes. At Michigan State University, an Institutional Review Board (IRB) reviews all research studies that involve human subjects before the research can be started. Their mission is to protect the rights of research participants. IRB will have access to the research data and results.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), please contact the principal investigator: Dr. Charles W. (Andy) Anderson, 319A Erickson Hall, Michigan State University, East Lansing MI 48824, (517) 432-4648, andya@msu.edu.

You have read about the goals of this project and the nature of your participation in it. Please read the options described below, initial the options for which you give consent for your participation, and sign and return the form.

Your initials give voluntary permission for you to participate in the activities you have indicated below. You can choose to participate in either the interview or assessment, or both (PLEASE INITIAL EACH LINE YOU APPROVE):

_____ The researchers may interview you about your understanding of science concepts. This will take place at a time that is convenient for you and will last approximately 30-40 minutes. The researchers may audio or video-record this interview. You will be compensated with a gift card or cash.

_____ The researchers may ask you to complete a written assessment that contains items about science concepts. If this takes place outside of regular class time, you will be compensated with a gift card or cash.

I voluntarily agree to participate in this study.

Student Name _____
(please print)

Student Signature _____ Date: _____

12. Adult Consent age 18 and older (without compensation, in class)

Dear Participant:

You are invited to participate in the *Environmental Science Literacy Project*—a research project that aims to develop learning progressions for carbon cycling. Learning progressions describe how knowledge about a topic changes over time. Participation involves taking written assessments on science topics and/or audio or videotaping an interview with you about your understanding of science concepts. The interviews may be scheduled at a time most convenient for you, and the interviews must be audio or videotaped in order to participate in this aspect of the study. The written assessments may take up to 30-40 minutes to complete and the interviews will last approximately 30-40 minutes.

Your participation in this study will help teachers learn about effective ways to teaching science. This will provide benefits to many students and teachers beyond those directly participating in the project. You may benefit from participating in this project by having the opportunity to have your ideas recognized and valued by others.

There are minimal risks associated with this study. Data from the study may be used in reports, articles, presentations, and in teacher education classes or teacher support materials. Your confidentiality will be protected to the maximum extent allowable by law. A pseudonym will be used in any written or oral reports about this work. Your identity may be recognizable in videotapes of interviews even though pseudonyms will be used to protect your identity. You may choose to have any segment of videotape in which you are identifiable not used in the study or in products or presentations. If you express discomfort with being videotaped, you will be audio taped instead. The researchers will strictly observe confidentiality procedures and all information about your identity will be kept in a secure location in the researchers' custody and only accessible by MSU researchers and Institutional Review Board members.

Your participation in this project is completely voluntary. You are free to withdraw participation at any time and for any reason without penalty during the project period (June 2015- August 201). There will be no penalty to you if you choose not to participate. You are free to refuse to answer any questions you do not wish to answer. The information that is obtained during this research project will be kept strictly confidential. The audio and videotapes will be used only by the investigators and will be kept in a secure location in the researcher's custody. A copy of the research results after this project is completed will be given to you at your request. Your refusal to participate or decision of discontinuing the participation will involve no penalty or loss of benefits to which you are otherwise entitled.

Your confidentiality will be protected to the maximum extent allowable by law. The data will be stored in locked filling cabinets at 319A Erickson Hall, East Lansing, MI or on secure servers at Colorado State University in Fort Collins, CO for at least 3 years after project closes. The project investigators will have access to the data for research purposes. At Michigan State University, an Institutional Review Board (IRB) reviews all research studies that involve human subjects before the research can be started. Their mission is to protect the rights of research participants. IRB will have access to the research data and results.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), please contact the principal investigator: Dr. Charles W. (Andy) Anderson, 319A Erickson Hall, Michigan State University, East Lansing MI 48824, (517) 432-4648, andy@msu.edu.

Your initials give voluntary permission for you to participate in the activities you have indicated below. You can choose to participate in either the interview or assessment, or both (PLEASE INITIAL EACH LINE YOU APPROVE):

_____ The researchers may interview you about your understanding of science concepts. This will take place at a time that is convenient for you and will last approximately 30-40 minutes. The researchers may audio or video-record this interview.

_____ The researchers may ask you to complete a written assessment that contains

items about science concepts. This will take place at a time that is convenient for you and will last approximately 30-40 minutes.

Your signature below means that you voluntarily agree to participate in this research study.

Student Name _____
(please print)

Student Signature _____ Date: _____