

COURSE TITLE: MAKING SCIENCE FUN: K-8 Hands-on Science Experiments

WA CLOCK HRS: 30
OREGON PDUs: 30

NO. OF CREDITS: 3 QUARTER CREDITS
[semester equivalent = 2.00 credits]

INSTRUCTOR: Lawrence Rzeznik
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COURSE DESCRIPTION:

Open your students' minds to the amazing wonders of science in the world about them. This practical applied science course focuses on using fun and interesting activities to teach students about themselves, their environment, and how the two relate. Some of the activities included in the course include: making rock salt ice cream (changes of state, observation, freezing points), effects of the environment on plant growth, and using Legos to demonstrate survival of the fittest. All activities included in this course can be done with minimal materials found around a typical home or school, are fun, and can be taught at different levels from K-8. Although simple to perform, these activities will challenge and reinvigorate your students' love for science while teaching them important life lessons. The activities addressed in this course are aligned with the national teaching standards. Participants in this course will be required to perform selected lab activities, research alternate activities on the internet, create useful labs of their own, and write papers about their information acquisition.

A science activities textbook is also recommended (\$25-\$35)

LEARNING OUTCOMES: Upon completion of this course, participants will have:

1. Have identified and modified hands-on activities that will support their science curriculum.
2. Understand and be able to communicate to students how these activities relate to various scientific principles (i.e. the scientific method, graph creating and analysis, force, transport, the relationship of organisms with their environment)
3. Have gained additional knowledge on scientific topics which they can incorporate into their teaching.
4. Have created usable lesson plans that include the activities in this course.
5. Have researched scientific concepts and activities on the internet to share with classmates through demonstration and lesson plans.
6. Be able to identify activities that can be used across curriculum.

COURSE REQUIREMENTS:

Completion of all specified assignments is required for issuance of hours or credit. The Heritage Institute does not award partial credit.

HOURS EARNED:

Completing the basic assignments (Section A. Information Acquisition) for this course automatically earns participant's their choice of CEUs (Continuing Education Units), or Washington State Clock Hours or Oregon PDUs. The Heritage Institute offers CEUs and is an approved provider of Washington State Clock Hours and Oregon PDUs.

UNIVERSITY QUARTER CREDIT INFORMATION

REQUIREMENTS FOR UNIVERSITY QUARTER CREDIT

Continuing Education Quarter credits are awarded by Antioch University Seattle (AUS). AUS requires 75% or better for credit at the 400 level and 85% or better to issue credit at the 500 level. These criteria refer both to the amount and quality of work submitted.

1. Completion of Information Acquisition assignments 30%
2. Completion of Learning Application assignments 40%
3. Completion of Integration Paper assignment 30%

CREDIT/NO CREDIT (No Letter Grades or Numeric Equivalents on Transcripts)

Antioch University Seattle (AUS) Continuing Education Quarter credit is offered on a Credit/No Credit basis; neither letter grades nor numeric equivalents are on a transcript. 400 level credit is equal to a "C" or better, 500 level credit is equal to a "B" or better. This information is on the back of the transcript.

AUS Continuing Education quarter credits may or may not be accepted into degree programs. Prior to registering determine with your district personnel, department head or state education office the acceptability of these credits for your purpose.

ADDITIONAL COURSE INFORMATION

REQUIRED TEXT

Tolman, M. 2006. *M. Hands-on Life Science activities for grades K-6*. J-B Ed. Jossey-Bass. San Francisco. Available from Amazon.com, approx. \$25.

OR

Tolman, M. 2006. *Hands-on Physical science activities for Grades K-6*. 2nd Ed. Jossey-Bass. San Francisco. Available from Amazon.com, approx. \$35.

- ***Hands-On Life Science Activities For Grades K-6***

ISBN# 0787978655

by Tolman, Marvin N.

Wiley-Interscience

[Buy from Amazon](#)

- ***Hands-On Physical Science Activities For Grades K-6 , Second Edition***

ISBN# 0787978671

by Tolman, Marvin N.

Wiley-Interscience

[Buy from Amazon](#)

MATERIALS FEE

Text: Hands-on Life Science activities for grades K-6, is available from Amazon.com, approx. \$25. OR Text: Hands-on Physical science activities for Grades K-8. 2nd Ed, is available from Amazon.com, approx. \$35.

ASSIGNMENTS REQUIRED FOR HOURS OR UNIVERSITY QUARTER CREDIT

A. INFORMATION ACQUISITION

Assignments done in a **course forum** will show responses from all educators active in the course. Feel free to read and respond to others comments.

Assignment #1: COURSE FORM: Visit Some Websites

Visit and read the required web sites. In the online response box, write 500-750 words in which you:

- Describe several kinesthetic learners you have taught, explaining what you did that worked for these students.
- Describe how you have used hands-on learning in your professional situation. Compare and contrast when your hands-on learning activities did and did not go well, and why.
- Discuss how hands-on learning can help children with disabilities.
- Bridging the Engagement Gap with Hands on Learning <http://www.raft.net/case-for-hands-on-learning>
- Utilizing Problem based in Science with Students with Disabilities https://digitalcommons.brockport.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1537&context=ehd_these
- Tactile-Kinesthetic Learners <http://www.studyngstyle.com/tactile-kinesthetic-learners.html>

Assignment #2: Watch Required Videos

Watch all of the required videos listed below to get an idea of the activities.

- Perform 15 of the activities that would be appropriate for your grade level, keeping a journal of your experiments and noting what went right or wrong.

- In the online response space, write the equivalent of a 3-4 (750-1000 words) page paper summarizing how your experiments went. Include any problems or modifications that could be made to improve the activity.

Required Videos:

1. Egg in bottle: <http://youtube.com/watch?v=773Rv8pZeOs>
2. Phototropism: <http://youtube.com/watch?v=Ze8NV7cvW8k>
3. Phototropism and geotropism: http://www.youtube.com/watch?v=zctM_TWg5lk&NR=1
4. Liquid nitrogen Ice cream: <http://www.youtube.com/watch?v=hKY0orWnYfQ&feature=related>
5. Egg and Vinegar: <http://www.youtube.com/watch?v=dSLGPI2qU4o>
6. Milk and food coloring: http://www.youtube.com/watch?v=Y_Qdv8xC_f0
7. Gas from soda: <http://www.youtube.com/watch?v=S-o54wEn2BQ>
8. Ocean in a bottle: <http://www.youtube.com/watch?v=BAZtIL9mzvQ>
9. Rock Salt Ice Cream: <http://youtube.com/watch?v=l9c5rmDQ9DE&feature=related>
10. Chicken Bone experiment: <http://youtube.com/watch?v=UK6PzUzHLuJ>
11. Corn starch and water: https://www.youtube.com/watch?v=N5_hwplixDg
12. Mentos and diet coke: • <http://youtube.com/watch?v=hKoB0MHVBvM> • http://youtube.com/watch?v=9vk4_2xboOE&feature=related
13. Crushing can with air: https://www.youtube.com/watch?v=xg5NiOwf_Zw
14. Simple Motor: <http://www.youtube.com/watch?v=3LuQ59vaDPo&feature=related>
15. Density lab coke vs. diet coke: <http://www.youtube.com/watch?v=xEsrqJdPYRc>
16. Deleted
17. Homemade Lava Lamp: <http://www.youtube.com/watch?v=AeZU1yJIZO0>
18. Breaking a ruler under a newspaper: <https://www.youtube.com/watch?v=UvMmfacVA24>
19. Flubber: <https://www.youtube.com/watch?v=rBMkpZWbyTY>
20. Carnation color change: <https://www.youtube.com/watch?v=KV4YuzuXpjQ>
21. Pepper and soap activity: <http://www.youtube.com/watch?v=66yAVJ3OQ6k>

Assignment #3: Describe How Your Experiments Worked.

Read one of the Tolman texts listed below. Select and try out another eight (8) experiments which meet your science needs and grade level. In the online response space, describe in 2-3 pages (500-750 words), which experiments you performed and how they went.

- Tolman, M. 2006. M. Hands-on Life Science activities for grades K-6. J-B Ed. Jossey-Bass. San Francisco. Available from Amazon.com, approx. \$25.
- Tolman, M. 2006. Hands-on Physical science activities for Grades K-8. 2nd Ed. Jossey-Bass. San Francisco. Available from Amazon.com, approx. \$35.

ADDITIONAL ASSIGNMENTS REQUIRED FOR UNIVERSITY QUARTER CREDIT

B. LEARNING APPLICATION

In this section you will apply your learning to your professional situation. This course assumes that most participants are classroom teachers who have access to students. If you do not have a classroom available to you, please contact the instructor for course modifications. Assignments done in a course forum will show responses from all educators active in the course. Feel free to read and respond to others comments.

Assignment #4: Create & Implement a Lesson

Assignment #4-A:

1. Create a lesson reflecting what you've learned in this course.
2. Use The Heritage Institute [lesson template](#) or one from your district, and either load your lesson in The [Heritage Institute lesson library](#), or, if you prefer not to share it with other teachers, just submit along with your essay.
3. Implement your lesson with students in your classroom. (If you are not teaching or it is summer, find youth in your community or another classroom to work with.)
4. Submit your lesson along with a 250-500 words of what worked well and what could be improved, into the response box.

Include any student feedback on your lesson as well as photos/web sites showing student work.

OR

Assignment #4-B:

1. Create a lesson reflecting what you've learned in this course (No need to implement), and either load your lesson in The [Heritage Institute lesson library](#), or, if you prefer not to share it with other teachers, submit to your instructor.
2. Write a 500+ word article concerning an educational area of interest to you.
3. The article could be an opinion piece, a call-to-action, a personal story or combination of all of these.
4. Submit your lesson along with your article via the response box.

Assignment #5: (500 Level ONLY)

Option A)

Please research the following

- Philosophical Empiricism
- John Dewey's Pedagogic Creed

Write your own 2-3 page philosophy of education which also justifies the use of experiential learning in its many forms (outdoor education, project-based learning, service learning, hands-on learning). Your paper should account for why learning through experience is both a moral and pedagogic necessity.

Post your paper in the online response box provided or upload the WORD document.

OR

Option B)

Another assignment of your choice with the instructor's prior approval.

C. INTEGRATION PAPER

Assignment #6: (Required for 400 and 500 Level)

SELF REFLECTION & INTEGRATION PAPER

(Please do not write this paper until you've completed all of your other assignments)

Write a 350-500 word Integration Paper answering these 5 questions:

1. What did you learn vs. what you expected to learn from this course?
 2. What aspects of the course were most helpful and why?
 3. What further knowledge and skills in this general area do you feel you need?
 4. How, when and where will you use what you have learned?
 5. How and with what other school or community members might you share what you learned?
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INSTRUCTOR COMMENTS ON YOUR WORK:

Please indicate by email to the instructor if you would like to receive comments on your assignments.

QUALIFICATIONS FOR TEACHING THIS COURSE:

Lawrence Rzeznik, M.S.; B.S.

Larry received his degrees in Biology and Education from S.U.N.Y. Geneseo. He has been a high school science teacher for since 1999. He was an adjunct biology and chemistry instructor for nursing colleges for one year.

Larry created curriculum for animal behavior, environmental biology, general biology, and forensics science courses. He is currently involved in creating various professional development courses, as well, as participating in graduate courses to stay up to date on current topics.

BIBLIOGRAPHY

MAKING SCIENCE FUN: K-8 Hands-on Science Experiments

Angliss, S., Challoner, J., Graham, J. *Hands – On- Science*. Kingfisher. 2001. New York.

Beard, Colin. & Wilson, John. *Experiential Learning: A Handbook of Best Practices for Educators and Trainers*. Logan Page Ltd. 2006. Philadelphia.

Brandolini, A. *Fizz, Bubble, and Flash*. Williamson Publishing. 2003. Charlotte, Vermont.

Sullo, B. *Activating the Desire to Learn*. Association for Supervision and Curriculum Development, 2007. Alexandria, VA.

Tobias, C. *The Way We Learn*. Focus On The Family Publishing. 1994. Colorado Springs, CO.