1) Purpose and Instructional Need (include goals and objectives)

There are several lessons that I teach as part of Elementary Science Methods that require students to carefully document their observations of very small items, such as the reproductive parts of a flower or the body parts of isopods or insects. Currently, the students must use hand lenses to magnify the objects. However, I also require them to document their investigations in a digital science notebook, which is accessed through the MS OneNote app running on department iPads. It is not feasible to use hand lenses to for taking magnified pictures of the very small items with the iPad. An affordable solution would be small microscope lenses that are specifically designed to attach to the camera on the iPad. This proposal requests funding for 25 such lenses with 20x magnification and 25 lenses with 60x magnification.

In addition, the ActiView document camera that currently exists in the BRC #3 classroom does not clearly magnify small objects such as those mentioned above. In order to display these very small items on the large projector screen, I am requesting a higher quality magnifying desktop camera. This device will also be very useful for creating high quality video demonstrations for online or hybrid classes.

Finally, I am requesting one mobile wi-fi wireless digital microscope with 200x lens. This microscope is designed to work with iPads, can be used out in the field (since it is wireless), and creates its own wi-fi network so that the magnified image can be viewed by all the student devices at the same time. The ProScope mobile microscope will allow me to take students out of the classroom and into the field to observe very tiny specimens undisturbed within their natural habitats. (It is important to note that my program already has access to 15 iPad minis with LifeProof cases that are safe to take out into the field, and can even be dropped in water without being damaged.)

(25) Neewer 20x Macro Lens for iPad and iPad mini ($10 x 25 = $250)
(25) WONBSDOM 60x Macro lens for iPad and iPad mini ($10 x 25 = $250)
1 HoverCam Solo 8 = $350
1 Proscope Mobile Wi-Fi Wireless Handheld HR Digital Microscope for iPad with 200x lens = $460

2) Identify how project will impact and benefit student learning include % affected and number affected.

These iPad microscopes will allow students to capture the magnified image or video of extremely small specimens used investigated in our lessons both inside and outside the classroom. Because they will be able to view the specimens more clearly at a magnified size, their understanding of the science concepts under investigation will become more accurate. It will also be easier for me to identify student misconceptions if they mislabel a clearly magnified image. All of my students will have the opportunity to use the iPad microscopes during my classes. The other instructors of Elementary Science Methods will also have the opportunity to use the iPad microscopes with all of their students if they so choose. There are approximately 100 students per semester enrolled in Teaching Elementary School Science.

2015-2016 COE Student Technology Fund Application
3) Describe how project aligns with COE Strategic plan and if possible department goals.

**COE GOAL 1:** Lead the state and nation by developing highly effective professionals prepared to educate, serve, and lead future generations.

By modeling the effective and innovative use of technology to enhance science learning in and outside the classroom, I will help my students to become more adept with using advanced technologies in their own classrooms.

**COE GOAL 2:** Faculty will distinguish themselves by engaging in creative and intellectually rigorous teaching, scholarship, and service.

Designing innovative lessons that use new technologies to enhance and deepen the learning that is possible within the classroom is fundamentally a creative process. I am always thinking about how to make each lesson more effective; how to pack more meaningful learning into every one of those 50 minutes. By increasing the clarity and magnification of very small specimens, the students and I will be able to engage in more meaningful discussion about the structure and function of the even tinier parts on the tiny objects. Before we can begin to understand something, it is important for us to be able to see it and to record the experience so that we can reflect on it as individuals and as a class.

4) Describe your plan to assess the impact of the technology project on student learning.

I will assess the impact of this new technology on student learning by comparing the digital science notebook entries of my students who have only had use of hand lenses with the entries of the students who are given the opportunity to use the iPad microscopes to view the very small items in our lessons. I will look for noticeable differences in the detail with which students are able to describe the specimens. Such clear, close-up imagery should also increase student understanding of the science concepts being investigated.

5) Support Needed:
   a. Who will install technology and provide technical support for project? Neil Clopton
   b. Where will resources be installed? Building _BRC_ Room # 3
   c. Does this room have the necessary data & electrical infrastructure reqd for your resources? Yes
   d. Does this proposal include funds to add the necessary infrastructure if not present? N/A
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2006 COE Student Technology Vendor Form

Forms without hard copy quotes will be returned to you.
neewer element 20x macro lens

Clip-On 3 Element 3 Group Macro Lens for iPhone 6S, 6 Plus/6/5S/iPad 4/3/2, iPad /1, Samsung Galaxy S6, S5/S4/S3, Galaxy Note 4/3/2 or SmartPhones

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- NOTE: When use the macro lens, suggest keeping 1-2cm distance from your object to take more clear pictures.

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- The magnification of 60X, observation clear, precise, pure white light close to natural light does not cast
- Portable and detachable, you can take photo with your devices at any time
ProScope Mobile Wi-Fi Wireless Handheld HR Digital Microscope for iPad, iPhone & iPod touch with 200X Lens - Designed for Law Enforcement CSI Crime Scene Investigating, Field, Science Education Classroom, Lab or Patient exam - View live video and capture stills

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