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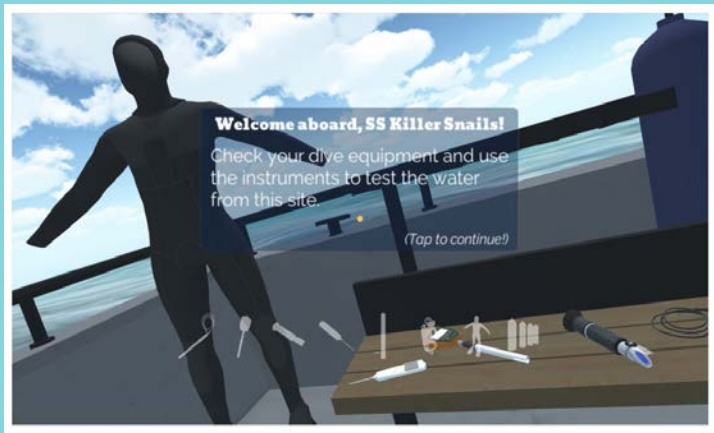

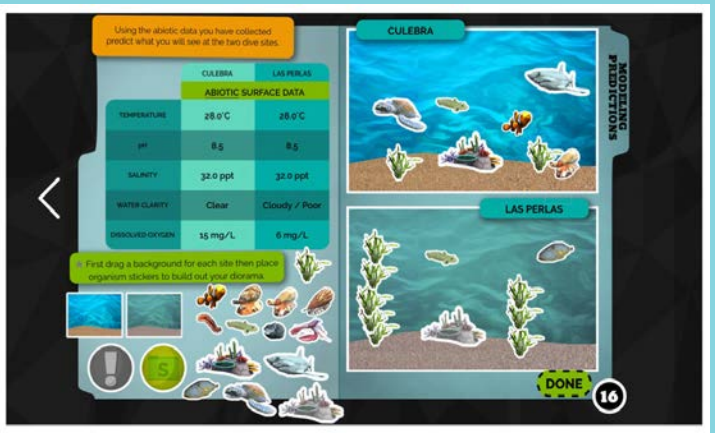

More About Killer Snails

KillerSnails.com

info@KillerSnails.com

@KillerSnails1

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BioDive: Getting Started

In BioDive, students are marine biologists traveling to international dive sites to study the impact of abiotic factors on biotic factors across three diverse marine ecosystems. This immersive journey begins with an anchoring phenomenon to spark curiosity and invite student inquiry. As students move through the experience, they toggle between their own personal digital science journal (DSJ) and expeditions in the field (Eastern Atlantic, Eastern Pacific, Indo-Pacific). Here, they will make observations, collect data, collaborate with fellow scientists and synthesize their knowledge to write a formal hypotheses about the impact of variables on changes to different ocean ecosystems.

BioDive was developed by a team of science teachers and scientists to model the process of scientific inquiry and discovery. Students use their VR goggles to make observations and use their laptops to manipulate data and synthesize their observations to demonstrate learning.

To begin this journey, you will need access to:

(1) Personal devices (e.g., laptops, chromebooks, iPads): Students will use these devices to log into their individual digital science journal.
(2) Smartphones and Cardboard viewers:
- Smartphones with wi-fi connection (Android device running a minimum of KitKat (4.4) or an iPhone 6 running at least iOS 8): These can be teachers' phones, administrators' phones, or school phones- as long as they can download an app. One smartphone per 4 students is ideal.
- Cardboard viewers (e.g., Google or other): These low-cost cases are available on Amazon and can transform each smartphone into a VR viewer.

-or-

A Web Enabled Device:
- Students can now view the VR in their web browser on a labtop or chromebook. If students are using an iPad we recommend they download the app and view in Toogle mode.

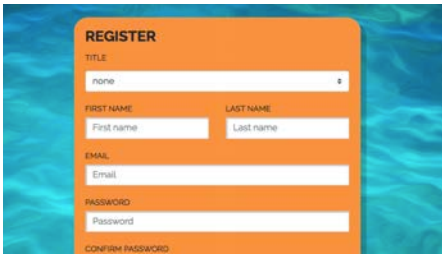
(3) Please be sure your school allows access to the website. If students can't access the journal because of a firewall, contact your IT person and request access for this site.

Please visit our FAQ for more information, https://biodive.killersnails.com/faq.php

Please feel free to email any other questions to info@killersnails.com

Registration

(1) REGISTER: Go to https://accounts.killersnails.com/register to create both teacher and student accounts.
(2) VERIFY: You will be sent a verification email. You will need to verify your account prior to logging in.
(3) LOG IN: Once you have verified your account you can login at https://accounts.killersnails.com/login



Once logged in:

From the main menu you will be able to add classes, edit your profile, and manage your apps.

When creating a classroom be sure to include student's names and unique email addresses. We will never use your students email addresses for communication outside of creating their BioDive accounts.

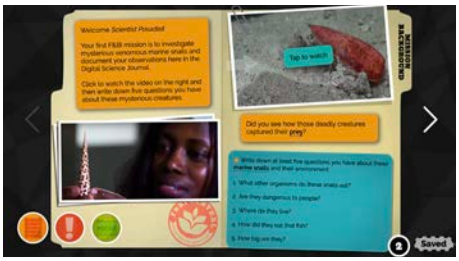
The account system will then email students and guide them through creating their own accounts, following the same steps as registration.

If your students can not receive outside emails. During registration you can create passwords for your students or a classwide password. You will need to share the login process with them prior to the experience.

When a student has verified the account and signed in their user icon will be filled in.

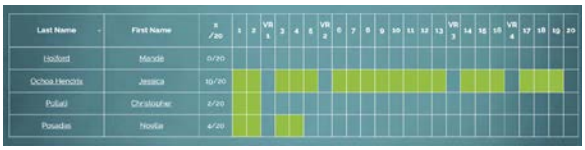
Digital Science Journal

After students have logged in they can begin BioDive by either clicking or going to https://biodive.killersnails.com/



When a teacher clicks the BioDive icon or goes to https://biodive.killersnails.com/ they will have access to a sample student journal which allows teachers to navigate to any page in the Table of Contents. Students can only navigate to pages they have started or completed in the Table of Contents.

Teacher Dashboard



(1) REGISTER: Go to https://accounts.killersnails.com/register to create both teacher and student accounts.
(2) VERIFY: You will be sent a verification email. You will need to verify your account prior to logging in.
(2) LOG IN: Once you have verified your account you can login at https://accounts.killersnails.com/login

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The account system will then email students and guide them through creating their own accounts, following the same steps as registration.

If your students can not receive outside emails. During registration you can create passwords for your students or a classwide password. You will need to share the login process with them prior to the experience.

When a student has verified the account and signed in their user icon will be filled in.
After registering your account at https://accounts.killersnails.com, you can view the dashboard at https://biodive.killersnails.com. In the Dashboard you can view where your students are in the experience as well as what they have done on each page of their digital science journal.

When looking at the dashboard you can view individual pages done by your students by tapping the green progess boxes. You can also leave your students written feedback as well as stickers when reviewing their progress.

When you leave feedback your students will be notified with a .

Students can then read your feedback and make fitting adjustments to their work.

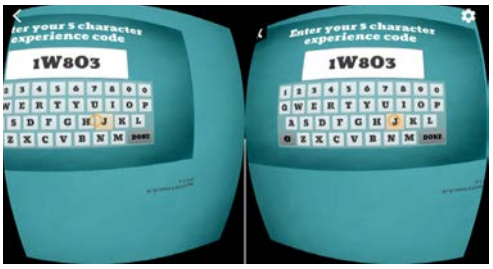
To access the virtual reality content (VR) you will need to:

(1) **iOS Users:** Go to https://apps.apple.com/app/id1453221806 to download BioDive from iTunes.

Android Users: Go to https://play.google.com/store/apps/details?id=com.KillerSnails.BioDive&hl=en_US to download BioDive from the Google Play Store.

Web VR Users: When students reach a VR scene in the digital science journal they will be provided a link to view the VR scene in their web browser.

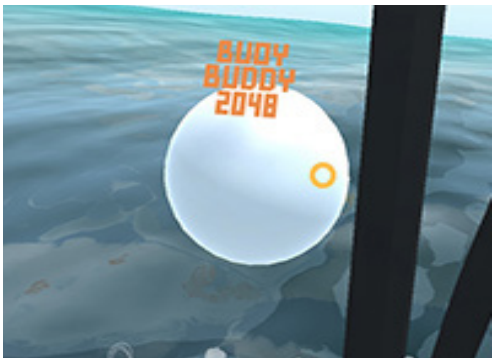
(2) Once installed, users can log in to the VR with their class code. Your unique 5 digit VR experience code is located at the top of your BioDive login page or on your class page.



It will look like EXPERIENCE CODE: 1W803 or 

Enter the code on your device and have students select their names to keep them on track in the experience.

(3) During the tutorial students will learn that this label  tells them when to enter a VR experience. Below this icon will be a prompt of what experience they will be entering.



(4) If students are waiting to use a VR headset they can visit the Dive Deeper  page to learn more about marine biodiversity.

(5) It is recommended that all devices are put into “Do Not Disturb” mode during VR use.

(6) If you need to get back to the main menu while in a VR scene, find a buoy and tap the button. The buoy will appear above you if you are underwater, or on the water if you are on the boat.

BioDive: Curriculum Overview

Lesson	DSJ	VR	Student Learning Objectives: Students will...
1. Mission Background	1, 2, VR, 3	View Hunt	Sign into Digital Science Journal (DSJ) and successfully complete the DSJ tutorial (p.1) Observe anchoring phenomenon (p.2) Develop questions about venomous marine snails based on observations (p.2) Understand the biomedical application of venomous snails (p.2) Observe three methods venomous snails use to hunt (VR) Predict predators and identify the prey of cone snails (p.3) Identify levels of turbidity in the cone snails' habitat (p.3)
2. Back to the Lab	4, 5, VR, 6,7	Start Dive	Classify oceanic zones (p.4) Predict essential features of a healthy marine ecosystem (p.5) Observe organisms in a coral reef (VR) Compare changes to biodiversity in the same ecosystem at two points in time (p.6) Categorize marine organisms by trophic level to distinguish between consumers and producers, autotrophs and heterotrophs (p.7) Observe the feeding pattern of organisms in a food chain (video clip)
3. Seas Under Seige	8, 9, 10, 11	---	Apply the 10% rule to the transfer of energy in an energy pyramid (p.8) Understand that a food web is comprised of interconnected food chains (p.9) Interact with a model and make observations about interdependent relationships among organisms within a food web (p.9) Design an oceanic food web (p.10) Elaborate on the predicted impact of trophic level changes in an ecosystem (p.10) Distinguish between abiotic and biotic variables (p.11)
4. Collecting & Analyzing Abiotic Data	12, 13, VR, 14, 15	Boat Scenes	Discover and understand the various equipment needed on a scientific dive expedition (p.12) Select the geographic dive location (p.13) Apply knowledge of scientific tools to collect abiotic data at a dive site (VR) Explain the impact of varying abiotic variables of temperature, pH, salinity, water clarity, and dissolved oxygen on biodiversity in a coral reef habitat (p.14) Construct a model of two coral reefs using abiotic data (p.15) Using qualitative and quantitative data, make inferences about how abiotic variables impacted organisms at two different dive sites (p.15)
5. Using Data to Revise Predictions and Collaborating to Identify Patterns in Data	16, VR, 17, 18, 19, 20	Dive Sites	Use vocabulary words to elaborate on predicted observations (p.16) Observe a control and a variable dive site to see the impacts of abiotic factors (VR) Use vocabulary to explain how abiotic factors impact biotic factors in a marine ecosystem and revise predictions based on new data (p.17) Collaborate with peers to collect, analyze, and review patterns in data and write about observed patterns in salinity, temperature, pH, water clarity, and dissolved oxygen across six marine environments (p.18) Use evidence and reasoning to support and submit a formal hypothesis on the impact of abiotic factors on biotic factors across one marine environment. (p.19) Call to action as student citizen scientists (p.20)

DI = Direct Instruction, VR = Virtual Reality, DSJ = Digital Science Journal