STEM + German Module
Das Leben eines Killifischs

Grade: K-5
Proficiency Level: Novice Mid – Novice High

Goals: Using the power point provided and classroom discussion and presentation students will understand various major forms of energy consumption. They will discuss their daily personal decisions that are either ecofriendly or sustainable and what they and their community can do better. Students will create informative pamphlets for presentation about energy sources.

Objectives: Students will use the new vocabulary to describe the decisions they make that impact their environment. They will be able to describe data represented on a graph in the target language.

STEM Content Standards	Foreign Language Standards
NGSS – 3-LS1 From Molecules to Organizsms: Structures and Processes - (Core Ideas) 3-LS1.B: Growth and Development of Organisms NGSS – 3-LS4 Biological Evolution: Unity and Diversity - (Core Ideas) 3-LS4.C Ecosystem Dynamics, Functioning, and Resilience - (Core Ideas) 3-LS4.C Adaptation	NSFLE 5C - Communication: 1.1, 1.2, 1.3; through oral and written conversation, interpretation, and presentations students communicate information, concepts, ideas, opinions, and emotions relating to the theme of lifecycles. - Connections: 3.1; reinforce and further knowledge of other disciplines (life sciences, natural sciences) through use of the foreign language. - Comparisons: 4.1; Students recognize words used in German to describe lifecycles as they have in English. - Communities: Students use language in school setting. Novice Mid/High - *Novice Mid* learners can communicate with isolated words and memorized phrases. They can recognize a number of words and around one phrase at a time with repetition. - *Novice High* learners can communicate in uncomplicated situations in limited and predictable situation. They rely on learned phrases and recombination of phrases learned. They can understand.

Duration 90 minutes (can be divided into 3 separate 30 minute lessons; Pre-Task – Introduction, Pre-Task – Discussion, Task stage with some revision of previous materials)

Objectives	- Students will identify the lifecycle of a south American/African Killifish and the different stages of the Killifish. - Students will recognize that the American/African Killifish relies on the time of year and environment to develop. - Students respond and use phrases and words from the lesson to describe the lifecycle of the American/African Killifish and the environment it lives in. - Students maintain utterances according to the *Novice High/Mid* models of proficiency.
Pre-Task Introduction	1)Start the lesson by introducing vocabulary to be use in the song Die *Schule vom Killifisch* by writing the word in a visible place and asking the following questions: - (Lehrer/Leherin) Wer ist hier ein Lehrerin? - (schwimmen) Alle schwimmen! –*Mime swimming for class* - (Schule) Wo finden wir eine Schule? - (Unterricht) Wann haben wir Deutschunterricht? - (lernen) Was lernen wir auf der Schule? - (Fisch) Was lebt in Wasser? 2)If your classroom has a Killifish as a pet – then Use it to sing this video. If not, use the video provided. Introduce the lesson today by mentioning the theme. - Wir lernen heute über Fische! Wer hat ein Fisch als Haustier? Wer hat eine Aquarium zuHause? (can extend by asking what kind of fish, how big, etc…) - Was sind einige populare Aquarienfische? 3) (slide 1) Start the PPT by reviewing 3 common *Aquarienfisch* ending with the *Killifisch.* Ask

	students questions and when they respond in English, give the German word/pronunciation and have students repeat them. - Was ist das? - Sehr gut/Ausgezeichnet/Genau! Das ist ein *Goldfisch/Kampffisch/Killifisch* 4) (slide 4) Guide lesson toward Killifish through the song. - Sehr gut! Heute lernen wir die Killifisch kennen! - Möchten wir ein Killifischlied singen? - Hier Hören wir ein Lied über Killifisch! Let the song play once through and then provide the students with the text for the song and play it again with them singing the last line of each. Everyone sing together, line by line or whole song.

Pre-Task
Lifecycle
	1) (slide 5) The lesson transitions with the song into killifisch discussion.
	
	- Woher kommt das Killifisch? (asks students)
	- Kommt das Killifisch aus Amerika, Südamerika, Afrika, Südeuropa, Asien und dem Nahen Ost? Ja! (repeat and point out geopraphical locations)
	
	(slide 6-7) Leads to discussion of specific annual Killifish from South America and Africa. Have students repeat/chant new vocabulary.
	
	- Die Killifische aus *Südamerika* und *Afrika* sind interresant.
	- Wo wohnen die Killifische aus Südamerika und Afrika?
	  o In *Pfützen und Tümpel*!
	
	2) Students identify issues of dry season and wet season for the Killifish.
	- In Südamerika und Afrika regnet es viel?
	  o Es gibt eine *Regenzeit* und eine *Trockenzeit*
	- Wo wohnen die Killifische, wenn es regnet? Wenn es trocken ist?

	3) (slide 7) The lifecycle of the annual Killifish is discussed here
	
	- Die Killifische wohnen in (*get the students to day word for puddle*) in (*students say regions where Killifish live in Puddles*)
	- Die Killifisch leben erst als Fischei (*pointing to the egg stage: diapause I/II/III*), und dann werden sie Larven. Endlich die letzte phase als erwachsene Killifische. Die erwachsenen Killifische legen neue Eier und der Zyklus geht weiter.
	  o Repeat the stages of the fish with the students and have them repeat it. Erst… und dann.. und endlich… und die erwachsenen Killifische liegen…
	- Aber was passiert, wenn die Trockenzeit kommt?
	  o Die erwachsenen Killifische stecken ihre eier in die Erde.
	  o Wenn die Pfützen und Tümpel austrocknen, bleiben die Eier da.
	  o Wenn es wieder regnet, hecken die Eier und sie werden Larven und dann später erwachsene Killifische.
	
	4) Show video from minute 0:30 – 1:18: https://www.youtube.com/watch?v=4sy3R3f_GCY
	
	- Narrate the video: Hier ist eine Pfütze von einem Elefants Fußabdruck in Afrika. Hier wohnen die Killifish. Hier sind die Killifischeier. Die Eier hecken, erst Larven, und dann erwachsene Killifische.
	- *After the video*. Später trocknet das Wasser aus und die neue Eier warten, bis es regnet.

Task – Organize the Lifecycle.	1) Divide students into groups of 2. Give each group the word cutouts and images for organizing. 2) Direct students to organizing the lifecycle of a fish, by first reading the words and repeating them with the class and allowing students to match the words with the appropriate images.

	3) While the students create the lifcycles with the images, draw a word cloud on the board with the main words of the lesson: *Killifisch, Lebenszyklus, Pfützen, Tümpel, Regenzeit, Trockenzeit, Ei, Larve, erwachsene Killifisch*. Give the students paper and drawing materials and allow them to draw the cycle they created and learned about.

Extensions:

This lesson can be extended into observations about our own lifecycles and the language to describe our stages of life or other organisms' stages of life in a similar model. Fetus->Adult

Background information:

There are many different kinds of Killifish. This lesson focuses on the Annual Killifish (*Austrofundulus limnaeus*) found in Venezuela to explore the lifecycle of fish. The *Austrofundulus limnaeus* has a similar lifecycle to Killifish found in African and other South American countries.

Podrabsky Lab at Portland State University: http://www.pdx.edu/podrabsky-lab/
Wikipedia page on General Killifish information: http://en.wikipedia.org/wiki/Killifish
Information about the annual Killifish Lifecycle: http://infolific.com/pets/fish-in-the-wild/killifish-life-cycle/
German Language Wikipedia Resource (see Verbreitung):
http://de.wikipedia.org/wiki/Eierlegende_Zahnkarpfen