

TIC Theme Timeline

Theme	Theme Duration*	Approximate Calendar Date
Watersheds (pre aquarium set-up activities)	Begin implimenting soon after school starts	Mid to late September
Aquarium Set Up and Start Up	10 days Tank running 30 consecutive days prior to egg arrival in November	Begin first or second week in October No later than October 15
Egg Arrival, Incubation, and Hatching	5-15 days	Arrive no earlier than November 1, Hatch date will vary with water temperature
Fry to Fingerling	4-6 weeks	Mid-late November-December
Habitat (fingerling life stage)	4+ weeks	January
Fish Culture & Fish Management	4+ weeks	February to release date

*Time and date may vary due to water temperature and other conditions

Trout Life Cycle

Trout Life Cycle Stages	Duration
Eggs (eyed)	5-15 days
Hatching	2-3 days
Yolk sac absorbed/swim up fry	1-2 weeks
Fry to fingerling	3-4 weeks
Fingerling	4+ weeks
Release date	Anytime between April to May

§ Fry = fish less than one inch

§ Fingerling = fish one inch or larger

TROUT IN THE CLASSROOM CURRICULUM MAP

Theme	Concepts	Activities	<u>Standards</u>	
Watersheds (Pre aquarium set-up activities)	Watersheds	Build a Watershed Branching Out	3.3.4.A4; 3.3.5.A4; 3.3.5.A5;3.3.7.A6;3.4.3.A1;4.1.3.D; 4.1.7.B; 4.1.12.C;4.2.3.A;4.2.6.A; 4.3.10.B;4.5.3.C; 4.5.4.C; 4.5.8.A	
	Water Quality Parameters	Grab a Gram		3.2.4.A.1; 3.2.7.A4
		From H to OH		3.2.6.A4 3.2.10.A(3.2.C.A4)
		Dirty Water		3.3.5.A3;3.3.8.A1 4.1.7.B;4.3.7.B;4.5.3.C 4.5.5.C;4.5.8.A
		Too Much of a Good Thing		3.2.7.B 4.1.7.B
		Silt, A Dirty Word		4.1.7.B;4.1.12.B; 4.1.12.C 4.3.7.B; 4.5.5.C
		Stone Soup		3.2.6.A4 3.2.6.A5 4.1.3.A;4.2.5.C
		There is No Point to this Pollution		3.3.5.A1; 4.1.7.B;4.1.12.C 4.3.7.B;4.2.6.C 4.5.4.A;4.5.5.C;4.5.8.A
		Water Quality Monitoring	A Snapshot in Time	3.2.7.B 3.2.10.A (3.2.C.A4); 3.3.6.A1 4.1.7.B 4.1.12.C;4.2.5.C;4.2.7.C
	Connecting Water Quality Parameters, Habitats, and Aquatic Life			

TROUT IN THE CLASSROOM CURRICULUM MAP

Theme	Concepts	Activities	Standards
		Water Quality Monitoring, from design to data	3.2.7.B 3.2.10.A (3.2.C.A4) 4.1.12.C;4.2.7.C
		Water Quality Windows	3.2.10.A (3.2.C.A4) 4.1.7.C
Aquarium Set Up and Start Up Duration 10 days	Amount and distribution of water on Earth	Drop in the Bucket or	3.3.8.A2;3.3.4.A4; 3.3.6.A4; 4.1.4.A;4.1.7B; 4.7.4.A
		How Wet is Our Planet	3.3.8.A2; 3.3.4.A4;3.3.6.A4 4.1.7.B;4.1.7B; 4.7.4.A
	Types of Aquatic Habitats	Water, Water Everywhere	3.3.8.A2 ; 3.3.6.A4 3.1.7.C;4.1.4.A 4.1.7B; 4.2.3.C;4.7.4.A
	System set-up/components Habitat needs of aquatic organisms	What Trout Need	3.1.3.A2;4.2.3.C;4.2.4.C; 4.5.3.D ;4.6.4.A
Egg Arrival, Incubation, & Hatching Duration 5-15 days	Life cycles of aquatic organisms Trout reproduction	It's a Trout's Life	3.1.3.A3; 4.1.7.C 4.7.7.B
		Only the Strong Survive	4.2.10.C;4.5.7.C
Fry to Fingerling Duration 4-6 weeks	Trout/fish biology	The Trout Body	3.1.3.A1;3.3.7.A 4.1.4.D 4.7.7.B
		This Fish has a Scale to Tell	4.1.3.D;4.2.6.C

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Theme	Concepts	Activities	<u>Standards</u>	
		Guess Who's Coming to Dinner	3.1.12.A2;4.1.5.A & C 4.1.7.A & C	
	Fish Identification	Fashion a Fish PA Style; Getting to know your local fish	3.1.3.C2; 3.1.4.C2; 3.1.5.C2	
	Population Growth and Limiting Factors	Go Fish	4.1.4.A;4.1.10.A; 4.1.12.A;4.1.3.D 4.1.10.D	
		How Many Bluegills Can Live in this Pond	4.1.10.A ;4.1.12.A	
	Distribution	Home on the Range	4.6.7.A 4.6.10.A	
Habitat (fingerling life stage) 4+ weeks	Stream habitats; trout habitats	Trout Stream, By	4.1.4.A;4.1.10.A; 4.1.12.A;4.1.3.D 4.1.10.D	
		Aquatic Adventures	4.1.4.A;4.1.10.A; 4.1.12.A;4.1.3.D 4.1.10.D	
		Habi-Trout	4.1.4.A;4.1.10.A; 4.1.12.A;4.1.3.D 4.1.10.B	
	Impacts of ecosystem changes	Dragonfly Pond	4.2.7.B;4.2.8.B;4.2.10.B	
	Fish as a food source, aquaculture	Water We Eating	4.4.7.A;4.4.10.C	
	Fish culture & Management (fingerling life stage) Duration 4+ weeks	Trout management & protection	Where Have All the Shad Gone	3.1.8.C1;4.5.4.C;4.5.6.A 4.5.8.A & C;4.5.10.C
		Stocking	Estimating Fish Populations	3.1.4.B2 3.1.5.C1;3.1.7.C1;3.1.8.C1
Be a Friend to Fishes			3.1.4.B2;4.1.12.E;4.3.12.A	

TROUT IN THE CLASSROOM CURRICULUM MAP

Theme	Concepts	Activities	Standards
		To Stock or Not to Stock	3.1.4.B2
			3.1.5.C1;3.1.7.C1;3.1.8.C1
		To Dam or Not to Dam	4.3.8.A;4.3.10.A
		Dam Design	4.3.8.A;4.3.10.A

TIC Alphabetical Activity List

Activity	Source	Page	Content Summary
1 A Snapshot in Time	HWHP	61	Investigate water quality data to illustrate the differences between a one-time snapshot sample and monitoring samples over time and space.
2 Aquatic Adventures	PFBC	55	Examine living/non-living components of a stream; create food chains
3 Be a Friend to Fishes	PFBC	61	Develop fishing regulations and compare to the actual regulations
4 Branching Out	WET	129	Construct a watershed model and simulate water flow
5 Build a Watershed	PFBC	1	Construct a watershed and simulate water flow
6 Dam Design	PFBC PWA	103 179	Identify the effects of dams on salmon or shad migration; design a dam that is appropriate for salmon survival
7 Designing a Habitat	PWA	19	Identify components of habitat that are essential for most aquatic animals to survive; design a habitat suitable for an aquatic organism to survive in an aquarium
8 Dirty Water	LIW	109	Compare soil erosion in vegetated & non-vegetated surfaces; examine the effects of soil erosion on nitrate levels and turbidity in water
9 Dragonfly Pond	PWA	184	Evaluate the effects of different land uses on wetland habitats, and discuss changes to minimize damaging effects on wetlands
10 Drop in the Bucket	WET	238	Describe the distribution of water on Earth and calculate amount of available fresh water
11 Estimating Fish Populations	PFBC	63	Using beans to represent fish, apply a mathematical model to estimate a population of fish in a waterway
12 Fashion a Fish, Pennsylvania Style, Fashion a Fish	PFBC, PWA	24, 56	Design a fish adapted for an aquatic habitat; survival adaptations
13 From H to OH	HWHP	15	Simulate acid/base solutions and determine the pH of solutions
14 Getting To Know your local Fish	PFBC	58	Create dichotomous keys to identify fish
15 Go Fish	PFBC	36	Identify habitat components and factors that influence carrying capacity; define limiting factors.
16 Grab a Gram	HWHP	29	Introduction to water quality measurements, such as ppm and mg/L

	Activity	Source	Page	Content Summary
17	Guess Who's Coming to Dinner	PFBC	37	Role play members of aquatic foodchains to demonstrate how energy is passed from organism to organism; match organisms with their aquatic habitat
18	Habi-Trout	PFBC	66	Determine if a stream site is suitable trout habitat
19	Hitting the Mark	HWHP	49	Investigate the concepts of accuracy and precision in data collection; learn the importance of writing detailed procedures
20	Home on the Range	PFBC	19	Identify the state and national range of fish species
21	How Many Bluegills Can Live in This Pond	PFBC	78	Role play fish to demonstrate how food is a limiting factor to population size
22	How Wet is our Planet	PWA	121	Describe the distribution of water on Earth and calculate amount of available fresh water
23	It's a Trout's Life	PFBC	74	Explore trout life cycle by playing a board game
24	Monitoring and Record Keeping	NJ	14	Collect data and monitor aquarium conditions and fish growth
25	Only the Strong Survive	NE	18	Describe how various factors affect egg and fry survival
26	Perch to Periscopes	PFBC	13	Compare features of a perch to a submarine; adaptations
27	Silt: A Dirty Word	PWA	176	Simulate how sedimentation changes a stream and its water flow; discuss sources of sedimentation and effects on aquatic organisms
28	Stone Soup	HWHP	35	Model or investigate the buffering capacity of alkaline water
29	The Trout Body	NJ	19	Identify the features of a trout and how they help it function
30	There is No Point to this Pollution	HWHP	136	Analyze data to learn about the cumulative effects of nonpoint source pollution
31	This Fish has a Scale to Tell	PFBC	29	Examine fish scales to determine the age of the fish and discuss environmental factors that affect fish growth
32	To Dam or Not to Dam	PFBC, PWA	105, 170	Evaluate the positive & negative effects of constructing a dam
33	To Stock or Not to Stock	PFBC	90	Role play individuals with varying perspectives to evaluate the positive and negative effects of stocking a stream
34	Too Much of a Good Thing	LIW	118	Conduct an experiment to determine the effect of nitrates on aquatic habitats
35	Trout Stream, By	PFBC	81	Draw an ideal stream habitat for a brook trout
36	Water Quality Monitoring, from design to data	HWHP	70	Analyze and interpret data to model the <u>process</u> of water monitoring; create a study design
37	Water Quality Windows	HWHP	164	Explore the different water quality ranges required for the survival of aquatic and marine organisms by interpreting water quality data

	Activity	Source	Page	Content Summary
38	Water, Water Everywhere	PFBC, LIW	6, 12	Use charts or keys to identify types of aquatic habitats
39	Water We Eating?	PWA	83	Identify foods derived from aquatic sources and their geographic origins
40	What Trout Need	NJ	29	Discuss how an aquarium simulates a trout's natural environment
41	When Will They Hatch	NE	23	Predict when eggs will hatch based on environmental conditions, (Note: Must get data appropriate for PA from PFBC)
42	Where Have All the Shad/Salmon Gone	PFBC, PWA	92, 166	Interpret data and analyze the effects of human activities and habitat changes on fish populations

SOURCES

HWHP – **H**ealthy **W**ater, **H**ealthy **P**eople: weblink for the resource and training opporunities

LIW – **L**iving **I**n **W**ater: weblink for purchase

NE – Nevada Dept. of Wildlife, Trout in the Classroom

NJ – New Jersey Department of Environmental Protection, Trout in the Classroom

PFBC – **P**ennsylvania **F**ish & **B**oat Commission, WILD About PA Fishes

PWA – **P**roject **W**ILD **A**quatic: weblink to workshop opportunities

WET- Project WET: weblink to workshop opportunities