## Physical Education 1-4

1. **Introduction**: Physical Education. This course will primarily be taken by students in grades 9 and 10, but since it is a graduation requirement the course may be taken in the 11th and 12th grades. This is a four semester course.

2. **Course Description**:
   Physical Education is a two year course which covers the standards established by the National Association for Sport and Physical Education (NASPE). Over the course of two years, students will participate in a broad range of educational experiences, outlined by the California State Physical Education Framework. The NASPE program goals are:
   a. Demonstrate motor skills and movement patterns needed to perform a variety of physical activities.
   b. Demonstrate knowledge of movement concepts, principles and strategies as they apply to learning and performance of physical activities.
   c. Assess and maintain a level of physical fitness to improve health and performance.
   d. Participate in physical activity on a daily basis, in class and outside of the classroom.
   e. Demonstrate knowledge of fitness concepts, principles and strategies to improve health and performance.
   f. Demonstrate and utilize knowledge of psychological and sociological concepts principles and strategies as applied to learning and performance of physical activity.

3. **Prerequisite skills and knowledge**: None.

4. **List of program goals/learning outcomes:**
   a. Students demonstrate knowledge of and competency in motor skills, movement patterns, and strategies needed to perform in the following areas: individual, dual, team sports, aquatics, rhythm/dance, gymnastics/tumbling, and combatives/self-defense.

      - PG 1: Knowledge and performance of movement patterns, simple to complex
      - PG2: Knowledge and performance of the six skill related components of fitness
      - PG 8: Knowledge and performance of five biomechanical principles (buoyancy, force, friction, drag and torque)

   b. Students achieve a level of physical fitness for health and performance while demonstrating knowledge of fitness concepts, principles and strategies.

      - PG 3: Understanding the five components of health-related fitness (flexibility, body composition, muscular strength, muscular endurance and cardiovascular endurance)
      - PG 5: Knowledge of the critical elements of essential nutrients (carbs, fat, protein, water, vitamins and minerals) and their relationship to healthy eating
      - PG 6: Assessing valid information about healthy food to make informed nutritional choices.

   c. Students demonstrate knowledge of psychological and sociological concepts, principles and strategies that apply to the learning and performance of physical activity.

      - PG 4: Improve and maintain physical health independently according to the Principles of Fitness

   d. Recognition and response to emergencies on land and in the water.

- PG 7: Recognition and response to emergencies on land and in water

e. Application of a growth mindset

| | |
|---|---|
| **Use Effort and Practice to Grow** | Understands that effort and practice improve skills, work quality, and performance and that the process takes patience and time |
| **Meet Benchmarks** | Achieves personal best work on almost all benchmarks and class assignments by setting goals, monitoring progress, and using resources and supports (i.e. study groups, teacher support, workshops, tutorials) |
| **Actively Participate** | Actively participates and takes initiative on the activity/discussion, teamwork, or independent time and has personal strategies for staying focused |
| **Build Relationships** | Actively builds trusting relationships with adults and peers to pursue goals, enhance learning, and get back on track as needed |
| **Impact Self and Learning Environment** | Monitors and adjusts individual role to positively influence the ups and downs of the classroom and learning environment |

(based on: *NTA Agency Rubric, New Tech Network)*

5. **Proficiency scales** aligned with the program goals listed above

| **Program Goals** | **Emerging**<br>0----2.0 | **Proficient**<br>2.5----3.0 | **Advanced**<br>3.5---4.0 |
|---|---|---|---|
| 1) Knowledge and performance of movement patterns, simple to complex | The student defines simple and complex movement patterns | The student relates simple to complex movement patterns and recognizes shared simple and complex movement patterns in two or more contexts | The student transfers knowledge of simple to complex movement patterns in multiple contexts and is able to extend the concepts to a higher level of abstraction |
| 2) Knowledge and performance of the 6 skill-related components of fitness | Student is able to define and perform all 6 skill related components in isolation. | Student is able to differentiate between the skill-components of fitness as well as understand and | Students are able to transfer both the knowledge and performance of the skill-related components of fitness to various activities. |

| | | | |
|---|---|---|---|
| | | demonstrate the relationships between them within a specific activity. | |
| 3) Understanding the five components of health-related fitness (flexibility, body composition, muscular strength, muscular endurance, and cardiovascular endurance) | Student identifies and defines the five components of health-related fitness in isolation | Student relates the five fitness components to physical and mental health and performances in a variety of contexts | Student transfers knowledge of the five components of health-related fitness in multiple contexts and extends the concepts to a higher level of abstraction |
| 4) Improve and maintain physical health independently according to the Principles of Fitness | Student defines the Principles of Fitness including the basic principles of physical activity (overload, progression, specificity), the FITT formula (Frequency, Intensity, Time and Type), and body types (ectomorph, mesomorph, and endomorph) | Student relates the Principles of Fitness (as indicated in column to the left) to personal fitness levels, physical characteristics, and goals in order to improve and maintain physical health | Student applies Principles of Fitness (as indicated) in order to create a sustainable fitness plan, independently adjusting physical fitness activity levels |
| 5) Knowledge of the critical elements of essential nutrients (carbs, fat, protein, water, vitamins and minerals) and their relationship to healthy eating | Student defines the essential nutrients; carbs, fat, protein, water, vitamins and minerals | Student relates each essential nutrient (carbs, fat, protein, water, vitamins and minerals) to healthy eating | Student transfers knowledge of the essential nutrients (carbs, fat, protein, water, vitamins and minerals) to changing nutritional needs & preferences throughout life |
| 6) Assessing valid information about healthy food to make informed nutritional choices | Student defines current reliable healthy nutritional sources | Student identifies relationships between current health related research and healthy nutritional choices | Student can transfer knowledge of accessing valid information about healthy foods into a balanced nutritional plan |
| 7) Recognition and response to emergencies on land and in the water | Student recognizes emergency situations on land and in the water | Student identifies appropriate responses in simulated emergency situations | Student demonstrates preparedness to apply lifesaving skills in emergencies on land and in the water |
| 8) Knowledge and performance of five | Student defines the five biomechanical principles | Student appropriately relates the role of | Student transfers knowledge of the five biomechanical principles |

| | | | |
|---|---|---|---|
| biomechanical principles (buoyancy, force, friction, drag and torque) | (buoyancy, force, friction, drag and torque) in isolation | the five biomechanical principles (buoyancy, force, friction, drag and torque) in a variety of performances | (buoyancy, force, friction, drag and torque) in multiple contexts and is able to extend the concepts to a higher level of abstraction as well as applies knowledge to improve performance. |

6. **Suggested textbook(s), materials, equipment and resources**
   - Suggested Text: *Moving For Life* 2nd Edition. Kendal-Hunt 2007

7. **Requirements satisfied**
   - 20 units are required to meet both district and state graduation requirements.
   - Physical Education course does not meet any specific UC/CSU entrance requirements, nor are these courses accepted as college preparatory electives.

8. **Appendices:**

   - Sample Sequence Year One: Program Goals: 1, 3, 8

   - Unit on Biomechanical Principles through swimming at Redwood High School:

***Understanding by Design*** **Expandable Template**

<table>
<tr><th colspan="3">Stage 1 Desired Results</th></tr>
<tr><td rowspan="4">Established Goals<br>Program Goal 8 : Knowledge and performance of five biomechanical principles (buoyancy, force, friction, drag, and torque)<br><br>Posture Line and Balance<br>Technique first/Speed second.<br>Inner focus vs. external distraction</td><td colspan="2">Transfer</td></tr>
<tr><td colspan="2">Students will be able to independently use their learning to…<br><br>Become coastal citizens that move with efficiency in aquatic environments.</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td>UNDERSTANDINGS<br>Students will understand that…<br><br>- Understanding and applying the principles of biomechanics allows one to achieve high levels of performance.<br><br>-Understanding of the transferability of the five biomechanical principles outside of an aquatic environment.<br><br>- Students will understand that</td><td>ESSENTIAL QUESTIONS<br>Students will keep considering…<br>1. How does understanding the five biomechanical principles allow you to become a more efficient swimmer?<br><br>2. Why should coastal citizens know how to be efficient in the water?<br><br>3. What are the essential components of posture, line and</td></tr>
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| | | |
|---|---|---|
| | proficiency in human movement increases speed, power and endurance. | balance?<br>4. How does improving technique improve performance?<br><br>5. How does applying technique to improve posture, line and balance improve your efficiency in the water? |
| | ***Acquisition*** | |
| | *Students will know…*<br><br>- Lifelong fitness can be attained through swimming.<br><br>- ***Posture, Line and Balance*** are critical components of all sport performance. | *Students will be skilled at…*<br><br>-Self-assessing individual performance<br><br>-Make necessary adjustments to performance |

| **Stage 2 - Evidence** | | |
|---|---|---|
| **Code** | **Evaluative Criteria** | **Assessment Evidence** |
| | ***Tamalpais Union High School District***<br><br>***Physical Education Program Proficiency Scales: Surface to Deep Learning Using "SOLO"***<br><br>***Structured Observation of Learning Outcomes***<br><br>Program Goal 8: Knowledge of five biomechanical principles (buoyancy, force, friction, drag and torque) | PERFORMANCE TASK(S):<br>*Students will show that they really understand by evidence of…*<br>1. Demonstrates correct technique for swimming the **freestyle stroke**. Applies the principles of biomechanics to achieve advanced performance in aquatics.<br>2. Improves efficiency (by at least 1 lap) in the water as shown through pre-and post-20 minute swim test<br><br>OTHER EVIDENCE:<br>*Students will show they have achieved Stage 1 goals by…*<br><br>1. Quiz and tests that show that students can define, identify, and explain, the role of posture line and balance as it applies to increased efficiency in the water.<br>2. Analyze and evaluate feedback from self/proprioception, and peer analysis.<br>3. Create a practice plan based on level of skill acquisition.<br>4. Determine appropriate strategies for improved performance.<br>5. Summative Assessment:<br>6. Identify students below proficiency. Provide verbal reassessment. |

| SCALe | Description | |
|---|---|---|
| 4.0 | Student transfers knowledge of the five biomechanical principles (buoyancy, force, friction, drag and torque) in multiple contexts and is able to extend the concepts to a higher level of abstraction | |
| 3.5 | In addition to score 3.0, in depth inferences with partial success | |
| 3.0 | Student appropriately relates the role of the five biomechanical principles (buoyancy, force, friction, drag and torque) in a variety of performances | |
| 2.5 | 2.0 plus partial knowledge of 3.0 | |
| 2.0 | Student defines the five biomechanical principles (buoyancy, force, friction, drag and torque) in isolation | |
| 1.5 | Student exhibits knowledge of four | |

**<u>Program Goal #8:</u> Pre/Post Assessment**

*Knowledge of five biomechanical principles (buoyancy, force, friction, drag and torque)*

***Level 2.0*** *Student defines the five biomechanical principles (buoyancy, force, friction, drag and torque) in isolation*

1. Define the following biomechanical principles:
    a. Buoyancy: An external force that can counteract the force of gravity. Buoyant force acts vertically upward. The size of the buoyant force acting on a body of water is proportional to the amount of body volume submerged beneath the surface of the water.
    b. Force: A push or a pull in a linear direction.
    c. Friction: A force acting at the interface of bodies in contact that opposes the direction of motion.
    d. Drag: A force that acts to slow the motion of a body moving through a fluid.
    e. Torque: Rotary force. The product of a force and its moment arm. A moment arm is the shortest distance between the force's line of action and the body's center of rotation. The size of the force and the size of the moment arm contribute equally to torque.

***Level 3.0*** *Student appropriately relates the role of the five biomechanical principles (buoyancy, force, friction, drag and torque) to levels of achievement in a variety of performances*

1. How does buoyancy impact swimmers efficiency in an aquatic environment? Buoyancy counteracts the force of gravity on the swimmer. In highly buoyant environments the efficiency of the swimmer may increase because it is easier to achieve a streamline position.
2. Explain the role of force in two different types of performances. How can the use of force support or undermine a performance? Muscular force in a performance produces movement and allows for the kicking or throwing of objects. By appropriately engaging force when throwing a football I can throw the ball to the receiver. When I use the force of my leg muscles during the flutter kick I can swim more efficiently. Without engaging adequate force I may not be able to reach my targets when throwing a ball or swinging a bat. With the right amount of force from my upper and lower body I can successfully and efficiently swim freestyle.
3. Describe how friction impacts two different types of performances. How can friction support or undermine a performance? Friction generally acts against the direction of motion. Friction increases with the roughness or interactivity of the surfaces in contact and with the amount of force pressing the two surfaces together. During a 100 meter sprint, a runner would slip and fall if there were not adequate

| | | |
|---|---|---|
| | of the five biomechanical principles (buoyancy, force, friction, drag and torque) in isolation | |
| 1.0 | Student exhibits an knowledge of up to three of the five biomechanical principles (buoyancy, force, friction, drag and torque) in isolation | |
| 0.5 | Student exhibits very limited knowledge of the five biomechanical principles (buoyancy, force, friction, drag and torque) in isolation | |
| 0.0 | Student exhibits no knowledge of the five biomechanical principles (buoyancy, force, friction, drag and torque) | |

Student Observations:

Teacher Feedback:

friction between her running shoes and the running surface (track). When ice skating, the slippery conditions of the ice and the design of the ice skates implies that there is less friction and the possibility of skating very fast becomes possible. With too much friction (like rough ice, or thick blades on skates), the skater would not be able to move as smoothly across the ice.

4. Describe the impact of drag on two different types of performances. Drag opposes the movement of bodies through the water. There is more drag when there is more roughness or surface area of the body, or if the body is moving faster in the water. Also drag is increased if the fluid is more dense or viscous. Streamlining body shape serves to reduce drag. In speed related sports such as swimming, skiing, skating and cycling, athletes wear tightly fitted apparel made of ultra-smooth fabrics. They also assume crouched (streamlined) body positions to reduce drag.
5. Identify how torque (positively or negatively) impacts two different types of performances.

A swimmer with longer arms can generate more potential force than a swimmer with shorter arms. In this way torque is impacted by the length of the moment arm from the axis. Another example of engaging rotary motion or torque is when swinging a bat. More torque is engaged when the range of motion of the swing is greater. If the batter begins the motion by rotating the hips and shoulders back the swing has more time to generate momentum for the swing.

***Level 4.0*** Student transfers knowledge of the five biomechanical principles (buoyancy, force, friction, drag and torque) in multiple contexts and is able to extend the concepts to a higher level of abstraction

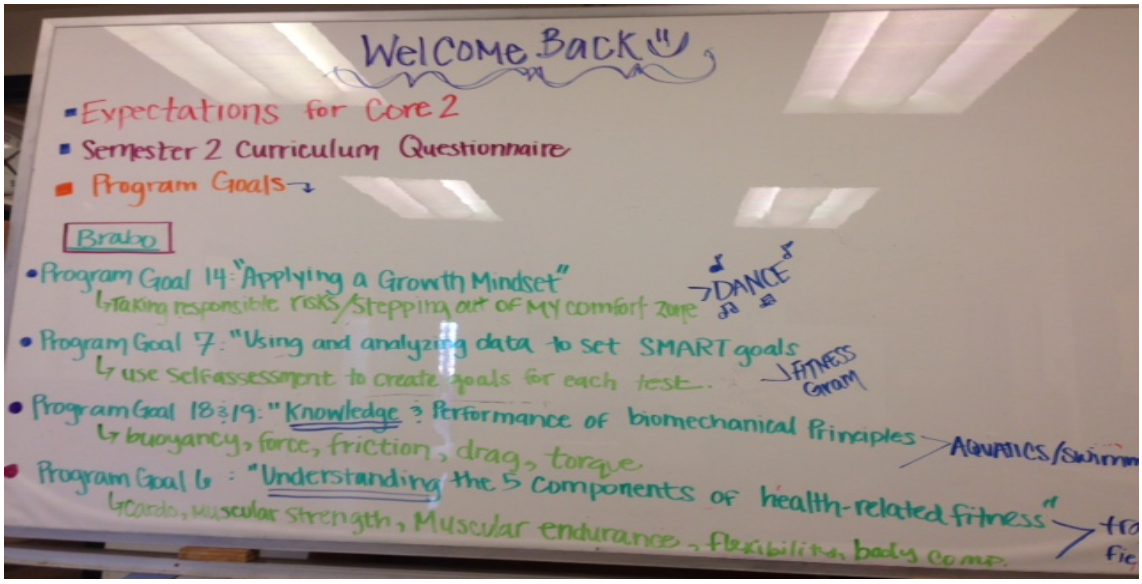
1. How can your awareness of biomechanical principles support your acquisition new skills and advance your performance in physical skills you already have? Why do athletes and coaches care about biomechanics in general?

**Stage 3 – Learning Plan**

LEARNING EVENTS

*Student success at transfer, meaning, and acquisition depends on…*

**Day 1 Preparation (No Pool):**




Introduce semester program goals
Reiterate classroom rules and expectations
Swim Survey

**Day 2 Preparation (No Pool):**

Program Goal #8 Pre-Assessment (written)

**Day 3 Preparation (No Pool):**

Seating chart in classroom
Pool area expectations and rules
Pool Tour (emergency phone, equipment. Restrooms, cubbies etc.)

**<u>Pool/Unit Rules</u>**

No Hanging on Lane-lines
No splashing, horsing around
Feet first entrance
No dunking

**LEARNING ACTIVITIES:**

**Day 1: The pool, intro to all rules and pool tour**
Explain grid system for drills (proper etiquette in lane lines)
Students self-select drill positions on the grid.
Easy swim 5-10 minutes/Snake Swim
Assign lane lines to students

**Day 2:**
Lane assignments & Quick Write:
-Review each of the principles- students list out loud before free write.
*"How can utilizing biomechanical principles improve my efficiency in the water?"*
15 minute pre-assessment: student will count their laps (down = 1, back =2).
Record laps in sportfolio and with teacher

**Day 3**
Intro to Posture Line and Balance Championship Swimming video Ch 1-3
(Refer to Lessons 1, 2 , & 3 in Freestyle Drills below)
-After explaining each of the drills, have students jot down 3 things they need to remember and illustrate what they will do in the water.

-pencil float drills-

- purpose is to balance vertically using proper posture elements
- breathing in pencil with lip touching water purpose to teach students to breathe with little head movement
- breathe in pencil without using hands or feet to get breath purpose to use only rotation to get breath not hands or legs

-sink it drill

- teaches swimmer to exhale completely
- purpose - to get students to exhale completely under water not above the water during swim.

-dead-man float to streamline drills (balance and prevent drag)

- understand balance tools and purpose of each tool
- arms above head lifts hips
- press chest downward slightly, more lift
- eyes look at floor not ahead

Debrief:
What is the purpose of learning to breathe in Pencil?
How do these drills allow you to become a more efficient swimmer?
What is buoyancy?

**After Drills:**
**50-50 workout:**
Swim 50 however they want
Use kickboards 50
Repeat until end of period

**Day 4**

Formative Assessment:

Name:_____ Date:_____

*Program Goal #8: Knowledge of five biomechanical principles (buoyancy, force, friction, drag and torque)*

**Buoyancy: An external force that can counteract the force of gravity. The force acts vertically upward. The size of the force acting on a body of water is proportional to the amount of body volume submerged beneath the surface of the water.**

Define in your own words:

_____

_____

**Force: A push or a pull in a linear direction.**

Define in your own words:

_____

_____

**Friction: A force acting at the interface of bodies in contact that opposes the direction of motion.**

Define in your own words:

_____

_____

**Drag: A force that acts to slow the motion of a body moving through a fluid.**

Define in your own words:

_____

_____

**Torque: Rotary force. The product of a force and its moment arm. A moment arm is the shortest distance between the force's line of action and the body's center of rotation. The size of the force and the size of the moment arm contribute equally to torque.**

Define in your own words:

_____

_____

-Form groups of 5-6. Assign each group a vocabulary term. Have each group collaborate to come up with their most accurate definition (in their own words) and create an illustration on poster paper that demonstrates their understanding of the definition. If time permits, have groups share out.

**Day 5**

**Read Article on BOUYANCY. In groups illustrate buoyancy (label gravity force and buoyant force)**

(Each One Teach One: Two articles focused on buoyancy and force.)

*(USE LAMINATED COPIES!)*

*Buoyancy and Flotation*

*Buoyancy is an external force that can counteract the force of gravity. Buoyant force acts vertically upward. The size of the buoyant force acting on a body in the water is proportional to the amount of body volume submerged beneath the surface of the water. Of course, when a person is in the water, gravitational force continues to act. A person is able to float only if he or she has sufficient body volume to generate a buoyant force greater than or equal to body weight. (In the presence of these two opposing vertical forces, the action of the net forces causes the body to either float or sink.) Individuals who have difficulty floating typically have high ratios of lean body mass to fat, or comparatively high body weight relative to their body size. One simple strategy for improving the ability to float is to hold a large breath of air in the lungs, thereby increasing body volume with a negligible addition of body weight.*

Create your most buoyant tool (did this later)

Chapter 7 “Championship Swimming”

Head lead balance drills, belly down, and then side head lead drills and side head lead with rotation then rotation and breath.

1. What are the balancing tools and what effect do they create?
2. How can these drills help you become more buoyant?

(Refer to Lesson 4 from Freestyle Drills below concerning head lead balance drills)

**Day 6**

**DRAG Lesson:**

**With a partner/ pair-share the definition of “drag” – write definition in sportfolio.**

**Individually, students will get a white board and dry erase marker to draw an example of "drag." As a formative assessment, students will hold up white boards. Teacher should share 3 examples of drag (legs down while swimming FS, running with a parachute, airplane…)**

**Continue Champ Swim Drills.**

Formative Assessment:

Name: _____ Period:_____

***Program Goal 8: Knowledge of five biomechanical principles***

_E____ An external force that can counteract the force of gravity. Acts vertically upward. The size acts on a body of water is proportional to the amount of body volume submerged beneath the surface of the water.

_B____ A push or a pull in a linear direction.

_C____ A force acting at the interface of bodies in contact that opposes the direction of motion.

_D____ A force that acts to slow the motion of a body moving through a fluid.

_A____ Rotary force. The product of a force and its moment arm. A moment arm is the shortest distance between the force's line of action and the body's center of rotation. The size of the force and the size of the moment arm equally contribute.

A. Torque
B. Force
C. Friction
D. Drag
E. Buoyancy

Poster Share-Out: In groups of four, create an illustration that demonstrates your understanding of force and buoyancy. Create examples that can be used inside and outside of water.

**Day 7 (Block)**
**AWESOME Torque Explanation xGames**
**https://www.youtube.com/watch?v=-5epz2jAIEU**

https://www.youtube.com/watch?v=8N83oVFIufU stop at 2:30

**TORQUE Lesson**

*In your sport-folio, with a partner*

1. Read the Article on TORQUE aloud with your partner.
2. Define Torque in your own words.
3. Create a written explanation of how TORQUE relates to freestyle. Give as much detail as possible.
4. Draw a person utilizing torque in free style. Label the MOMENT ARM and where Rotary Force initiates.
5. Draw a person utilizing torque in another activity. Label the MOMENT ARM and where Rotary Force initiates.

**TORQUE**

"Torque" is a way of describing how hard something is turned or twisted, in the same way we talk about "forces" as something that pushes or pulls. If we want to move a heavy box across the floor, we need a large force to push it. In the same way, if we want to turn a rusty bolt we will need a large torque.

Suppose you do have a rusty bolt that is stuck and you need to turn it. You know you will need a large torque to do this, but how can you make this? It's easy! It turns out that torque is the product of force and distance. In other words, to make a large torque you need either a large force or a large distance. To turn a rusty bolt you would put a wrench on it and push or pull on the end of the wrench. The "force" is how hard you push or pull, and the "distance" is how far from the bolt you are pushing or pulling. If you push or pull far away from the bolt, which requires a long wrench, the torque is bigger than if you push close to the bolt. If you have a really long wrench you don't need much force to turn your bolt, whereas if you only have a small wrench you will need to push or pull much harder to produce the same torque. Another important ingredient is that you push on the wrench in a direction perpendicular to the wrench.

You may also have heard the word torque describing the performance a car engine, for example you might read that a certain engine produces "high torque". This means that the engine is good at turning the wheels of the car.
**IN POOL**
Using thigh buoy, students will practice freestyle arms and rotating hips/shoulders (Torque).
*Students should extend arms (the moment arm) as far as possible to apply force to the rotation of shoulders and hips.

**Day 8**
- Assign each group a category. Students will compare and contrast level 1 and level 5. How does each of the elements in your posters contribute to efficiency? How does using your body in this way improve your efficiency biomechanically? Why is level less biomechanically efficient?
- Have students self-assess where they are in each of the categories based on the rubric.

- In the water, assign experts to provide swimmers with peer feedback on their performance from each category.

| CATEGORY | 1 | 2 | 3 | 4 | 5 | Self-Assessment: Comments | Peer Assessment: Suggestions |
|---|---|---|---|---|---|---|---|
| **Kick** | Kicks w/ toes pointed or flexed<br><br>Kicks from the knees<br><br>Kicks as if riding a bicycle in the water | Still kicks from the knees, but toes are relaxed<br><br>Too much splash or no splash | Alternates between kicking from hips and from knees<br><br>Toes are relaxed<br><br>Limited kicking rhythm | Kicks from hips with toes relaxed most of the time<br><br>Rhythm of the kick may be uneven | Kicks from hips, toes relaxed\maintains fluid rhythm<br><br>Makes some splash while kicking | | |
| **Arms** | Struggles to get anchor arm to hesitate and wait for top arm to reach and connect hip to elbow before vaulting past anchor<br><br>No flow to the arm movement | Performs basic arm movements, the anchor arm barely hesitates for the top arm to reach and connect hip to elbow, before vaulting past anchor | Swims with a good anchor arm and attempts to hesitate for the top arm to reach and connect hip to elbow before vaulting past anchor | Anchor arm usually hesitates for the top arm to reach and connect hip to elbow before vaulting past anchor | Anchor arm always hesitates for the top arm to reach and connect hip to elbow before vaulting past anchor | | |
| **Hand Entrance** | Lots of splash as arm or hand enters the water first, rather than the fingertips cutting the water<br><br>As soon as | Lots of splash as the arm or hand enters the water first, rather than the fingertips<br><br>As soon as hand enters the water, it | There is little pull and push as the student drags the arms through the water<br><br>Hands tend to hit the water, | The arms enter the water fingertips first most of the time<br><br>Some dragging below the surface on the | Fingertips hit water first and the arm stretches out to hold the line | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | hand enters the water, it pulls water down the side, back to the waist | pulls down the side, back to the waist | rather than entering fingertips first | forward movement of the arms in the water | | | |
| **Body Posture**<br><br>**Drag** | Body is not in a streamline position<br><br>Hips and legs are causing a lot of drag<br><br>Feet are so low that there is no splash when the student is kicking.<br><br>Hips and knees bending a lot | Body is not in streamline position<br><br>Hips and legs are causing some drag<br><br>Feet are still low and there is little splash when the student is kicking.<br><br>Hips and knees are somewhat bent | Body is streamlined some of the time<br><br>Hips and knees are straight.<br>Heels of the feet are breaking the surface and there is a small splash when the student is kicking sometimes | Body is usually in a streamline position<br>Hips and legs are high on the surface with limited drag<br><br>Heels are at the surface most of the time splash when the student is kicking | Body is always in a streamline position<br>Hips and legs cause no drag<br><br>Heels break the surface every time and the splash is small when the student is kicking | | |
| **Posture:**<br>**Eyes**<br><br><br><br>**Neck** | Head and eyes are all over the place, focusing on the feet, the wall, etc.<br><br>The student rarely has a long neck and chin back especially during the inhalation | Head and eyes are all over the place, focusing on the feet, the wall, etc.<br><br>The student rarely has a long neck and chin back especially during the inhalation | Head and eyes are beginning to focus on the floor<br><br>The student often has a long neck and chin back but not during the inhalation | Head and eyes are usually focused on the floor<br><br>The student often has a long neck and chin back including during the inhalation | Head and eyes are always focused on the floor<br><br>The student always has a long neck and chin back especially during the inhalation | | |

Freestyle Stroke

Spring 2012

Student: _____

Peer Assessor/Coach: _____

**Day 9**
**(Friday) Friction Lesson: Bill Nye Friction Vid:**
**https://www.youtube.com/watch?v=7EPwwMU94OA**
**(Stop at 11:30)**
**Quick Write:**
In Sportfolio:
-Describe how friction impacts two different types of performances.
-How can friction support or undermine a performance?
-Illustrate 2 examples of friction.

Jeopardy: https://jeopardylabs.com/play/pg-18-biomechanical-principles

**Day 10**
**Warm up 100 any style.**
**Swimming Work Out (Laminated)**
100 Kick Boards
100 Thigh Buoys
100 Free Style
REPEAT until teacher says STOP

Memory Game: Find the matching questions and answers in/out of pool

**Day 11 Block**
Quiz-quiz-trade
Buoyancy Lab (Create Flotation device and RACE!)
Free Style Lap Swim

**Day 10:**
Lap swim
Review all drills:
Head Lead
Head Lead w/ Rotation
1 Arm Lead

Am Lead w/ Rotation
Free style (allowed choice of using thigh buoy) for 10 minutes.

**Day 11:**
Final Assessment
15 minute swim

**Day 12: Block**
*Station Biomechanics Lab in Pool*
*Assign 1 student as station leader at each station.*
*Make up Assessment*

***Day 13: Friday***
*Final Written Assessment On Moodle*

Name_____ Class Period:_____

**Aquatics: Posture, Line and Balance**

1. List and explain the critical elements of good swimming **posture**.
   a.

   b.

   c.

2. List and explain the **balancin**g tools that serve to eliminate drag.

   a.

   b.

   c.

3. Why are Posture, Line and Balance important for a swimmer?

4. What are the benefits of good posture out of the water: walking, standing, sitting?

5. Describe the technique for breathing during freestyle swimming. (Post Test: Think about the drill we did in the classroom.)

6. Explain the items below as if you were the coach explaining them to a swimmer. Be specific and exact.

   a. What does each concept mean and when do they occur?

   b. Setting the anchor:

   c. Coming onto the balance line:

   d. Moving past the anchor:

7. How does "championship swimming" differ from your previous understanding of freestyle swimming? List and explain 3 ways below. Be exact, specific.

   a.

   b.

c.

8. Draw and label a swimmer (anchor, balance line, eyes, drag):

9. What level would you say you were before we started on a scale of 1-10. 1=never put head under 10= varsity high school.

10. Describe your improvement in the water:

11. What do you currently focus on the most?

12. What is the toughest aspect of swimming for you?

## Freestyle Drills

Key "buzz words" describing light rhythmical freestyle
Posture, line, and balance (ribs in, back flat)
Power comes from rotation—vaults your body over your anchor
Rotate hips and shoulders as a unit using core strength
Recover your arm in front of your body
Press for a breath. DO NOT REACH for a breath (breath should be in line with the body)
Breathe with 1 goggle out of the water, one under
Breathe every 3rd stroke for balance
Eyes look straight down
Water line cuts your ears in half
Front quadrant swimming (keep your arms in the front part of the stroke as much as possible. Done by using a partial catch-up stroke.)

Posture Line Balance

**Lesson 1: Pencil**

Purpose: Students will find their center and keep that line when swimming

Posture:

- Chin back Float head
- Flat back
- Long neck, no wrinkles in the back of the neck
- Suck belly button in and up
- Point toes
- Legs together
- Full lungs – get air by tilting head back
- Learn to balance from inside

**Lesson 2: Sink it**

Purpose: Learn to exhale all air while mouth is in water and only inhale when mouth is out.

- Take a few breaths
- Blow out hard and sink to bottom
- Exhale only when mouth is in water
- Inhale only when mouth is out

**Lesson 3: Deadman's Float to Streamline**

Purpose-Students will notice that the arms balance the legs and hips.

- Take a few breaths without hands or feet
- Arms up to surface slowly
- Look straight down – so water cuts through the middle of ears
- Arms up in front, lift hips
- Bring arms together (implode)
- Press lungs down subtly; will lift hips more

Freestyle lessons page 2

**Lesson 4: Freestyle Balance Drills Face Down**

Purpose- Position of head and leaning into lungs will lift hips and legs
lessening drag. Less drag equals less effort and increase speed and endurance.

Head Lead Balance Drill:

- Arms in saddle, hands on front of thigh
- Look straight down to the floor
- No wrinkles in back of neck
- Eyes straight down; brings hips up

- Press lungs down toward floor, pressure from lungs lifts hips
- Share the tube concept, press down on 1 side of tube the other side comes up
- Small kick

1. Head Lead Balance Drill

Arms are in their saddles (elbows are next to ribs and hands relaxed)
Head down
Grow the neck (long high neck)
Grow the spine
Ribs in
Flat back
Kick as little as possible (this is a balance drill, not a kicking drill)

**Lesson 5: Side Balance Drills Adding Rotation**

Purpose- Maintain Line and Balance on Side, perpendicular body to floor position equals line, fastest position in water. Mac Truck (on belly) vs corvette (side to side), barge or cutting swimmer

Head Lead Balance Drill on Side:

- Posture, Line and Balance
- Shoulder presses down toward the floor
- Small, steady, easy kick
- Arms in the saddle

Head Lead Balance Drill with Rotation
Critical…Rotation, think from low hips this is the power of freestyle –

Head Lead Drill-Rotation: Coach calls turn.

- Maintain PL&B on side
- Arms in the saddle
- Leave head in downward (eyes to floor) position during the rotation
- Think rotate from bottom of hips
- Rotate top of body down onto the bottom line
- No pause in the middle on front
- Critical…Think turn from the bottom of the hips

**Lesson 6: Head Lead Balance Drill add Breathing with turn**

Purpose: Learn the breath as part of the rotation

- On side, eyes at floor,
- As the turning hips align with head the head and hips continue to turn together
- When rotation is complete, take breath then return head to look at floor.
- Keep corner of mouth under water when taking breath
- Too much lift will rotate body to far
- Half of head is still in the water

- Top of head is still leading
- Actually breathing below surface of the water in trough

**Lesson 7: 1 Arm Lead Drills: Right Arm Lead**

Purpose- learn the position of the hand in the finish of the rotation

- Right arm extend overhead palm to floor, eyes toward floor
- Left arm comes across body, forearm on belly button
- Keep elbow low, no light between elbow and ribs
- Don't use elbow to balance body
- Left arm position is where the arm finishes in the normal stroke as the elbow moves in a circular motion, hand does not extend to hip
- Lead with top of head
- Take breaths with corner of mouth in water, half of head under water

**Lesson 8: Front Quadrant Swimming Drill**

Purpose: How to rotate from side to side from 1 arm drill position

- Lead arm- Palm stays in position, elbow bends out a little making the whole forearm and hand an anchor that the body will rotate by.
- Setting the anchor connects the elbow to the hips
- Top arm begins circular motion at the elbow with hand relaxed.
- As elbow comes above head, the stretch can be felt all the way into hips and that is when you vault pass the anchor and take the top side down onto the balance line.
- Good swimmers rotate their body by their hand/anchor
- Non-Championship swimmers put their hand in the water and pull the hand down to their side

Beware of pulling bottom arm too soon. Wait until top elbow is over anchor, this gives more power to the stroke, must be patient and wait for top elbow to be over head before anchor and vault by.

NOTE>>>The recovery is a swing not a lift

Transition Drill

Swimming Rhythm

- PL&B
- Long neck
- Ribs in and up
- Head lead
- Super slow motion
- Watch for big scissor kick cheating
- Hands should be traveling forward, not entering water at head, reach
- Eliminate as much resistance as possible, with front quad circular stroke
- Do not extend elbow into straight arm

Drill 1 - 2 breaths on side with 1 arm lead, then super slow stroke motion for 3 breaths on each side breathing every 3 strokes, patience, circular motion, then add speed a little at a time.

Linear Motion with Drag
Swimming

REDUCE SWIMMING TIME

Increase Swimming Velocity  Decrease Distance

| FACTORS THAT SLOW YOU DOWN | FACTORS THAT SPEED YOU UP |
|---|---|
| • Decrease internal force<br>• Decrease application time of force<br>• Increase Mass | • Increase application time of force<br>• Decrease Mass |
| Decreasing internal force ultimately decreases drag and friction forces | Increasing internal Force ultimately increases external force and friction force. |

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