

Physical Education Learning Activity Types^{1,2}

This taxonomy of learning activity types in physical education is intended to illustrate and suggest tasks that can comprise a curriculum-based lesson, project, or unit that addresses cognitive, psychomotor, and affective learning objectives. The activity types are rooted in the National Association for Sports and Physical Education's (NASPE, 2004) standards that assist students in building the knowledge, skills, and confidence to achieve, enjoy, and maintain a physically active and healthy lifestyle. The description of each individual activity type includes a list of possible technologies that may be used to support it. Tools such as exergames, pedometers, and heart rate monitors can provide creative ways to engage in physical activity and its monitoring (NASPE, 2009).

The taxonomy incorporates physical fitness and motor skills development activities. Consequently, the two major categories in the taxonomy are *physical fitness* and *motor skill development*. Physical fitness is sub-divided into those learning activities that help students build *cognitive understanding (knowledge development and application)* and *psychomotor development (practice and application)*. The *motor skill development* section is also subdivided into *cognitive* and *psychomotor* categories. In all, we have identified 56 distinct learning activity types within these subdivisions of physical education. Teachers should consider planning each lesson, project, or unit to include more than one activity from each of the cognitive and psychomotor tables that follow.

In each of the following activity types, affective learning outcomes are linked to explicit cognitive and psychomotor goals. Whether affective learning is a component or the central focus of instruction, specific instructional strategies may be employed to ensure its inclusion. A combination of activity types such as learning game-playing strategies while playing the game and cooperating as a team member, for example, represent important aspects of both affective and cognitive learning in physical education. In a physical fitness unit, students could self-assess their physical fitness levels, then create fitness programs using that information.

The physical education activity types are presented in the tables that follow, along with possible technologies that may be used to support each type of learning activity.

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Physical Fitness

Physical fitness is a physical state of well being that helps people to perform daily activities with vigor, reduces the risk of health problems related to lack of exercise, and provides a fitness base for participation in a variety of physical activities. The activity types below reflect two areas of physical fitness: health-related physical fitness (HRPF) and skill-related physical fitness (SRPF) (Miller, 2005). Combining and sequencing the activities below can help students to understand, acquire, practice, and use physical fitness. Educational technologies can assist students' linking specific physical fitness knowledge and concepts to real-world situations, and to measure, interpret, and prescribe appropriate fitness activities.

Cognitive. The purpose of physical fitness-related cognitive activities is to build knowledge about the effects of exercise on health, to engage in practices that develop and maintain physical fitness, and to value physical activity for health, enjoyment, challenge, self-expression, and/or social interaction.

Knowledge development.

Activity Type	Brief Description	Possible Technologies
Read text	Students extract information from textbooks, laboratory activities, etc.; both print-based and digital formats	Web sites, electronic books, online databases
Take notes	Students record information from lecture, live or recorded games, videos, presentations, group work	Word processor, mobile device, tablet, wiki
View images	Students examine still images/objects; print-based or digital format	Document camera, digital camera, Web sites
View a presentation/demonstration	Students gain information from teachers, guest speakers, and peers; moving images/objects (video, animations); synchronous/asynchronous; in-person or multimedia	Presentation software, video, Web-based virtual demonstrations
Explore/examine concepts and/or principles	Students gather information/conduct research using print-based and digital sources	Web search engines, content-specific interactive tools
Ask questions	Students develop questions related to course material/concepts	Word processor, wiki
Answer questions	Students respond to teacher, peer, written, or digitally posed questions	Word processor, quiz software, discussion boards, wiki, student response system

Discuss	Students engage in dialogue with one or more peers; synchronous/asynchronous	Discussion fora, email, text message, videoconferencing
Take a quiz/test	Students respond to questions on a test or quiz	Word processor, quiz software, Web sites, student response system
Create a representation	Students develop a representation of a physical fitness concept or process (in text, images, presentation, concept map, etc.).	Drawing software, concept mapping software, presentation software, video camera

Knowledge application.

Activity Type	Brief Description	Possible Technologies
Learn a procedure	Students learn how to use equipment safely and appropriately	Video demonstrations, Web sites, text files
Practice a procedure	Students practice using equipment and software, measuring and collecting data	Realtime data collection tools, content-specific software
Select a health-related physical fitness test	Students learn the correct form(s) for and choose relevant test(s) to measure a physical fitness component (e.g., muscular strength, agility, coordination)	e-books, Web sites, virtual demonstrations
Generate/collect data (pre- and post-)	Students generate data (e.g. heart rate, number of sit-ups, etc.) by performing and administering HRPF tests	Realtime data collection tools, content-specific assessment software
Analyze data	Students compare and contrast data collected against criteria and/or previous analyses	Spreadsheet, mobile device
Set goals	Based upon previous data analysis, students identify appropriate physical fitness goals	Word processor, content-specific assessment software
Maintain a physical activity log	Students record a log of activities, perceptions, reflections on feelings; both in school and outside school	Concept mapping software, word processor, spreadsheet

Create a fitness plan	Students design and modify individualized fitness plans to address specific goals (e.g., to improve flexibility, endurance)	Concept mapping software, word processor, spreadsheet
Observe and evaluate self and/or peers	Students observe their own or a peer's performance and analyze the performance against predetermined criteria (form and/or product)	Digital camera, digital video camera, content-specific assessment software, realtime data collection tools
Provide feedback & recommendations	Students use information from fitness assessments to improve selected physical fitness components	Word processor, videoconferencing, audiorecorder, discussion fora
Demonstrate/teach a physical fitness concept or principle	Students share their understanding of a physical fitness concept or principle	Digital camera, digital video camera, presentation software, realtime data collection tools

Psychomotor. Psychomotor learning activity types help learners to practice and apply health and skill-related physical exercises to develop and maintain a healthy lifestyle. The sequence of these activities—in that they appear following the knowledge-related activities described above—demonstrates how students can engage in activities to understand, acquire, practice, and perform appropriate exercises in to improve physical fitness.

Practice.

Activity Type	Brief Description	Possible Technologies
Do an exercise/calisthenics	Students select and perform an appropriate exercise to improve a specific component of physical fitness	Exergames
Practice an exercise	Students continue to do a previously-learned exercise to develop and improve a specific component of physical fitness	Exergames
Practice various types of physical conditioning	Students practice a variety of physical activities to develop a component of physical fitness	Exergames
Evaluate and revise physical performance	Students review, consider, and make changes to an exercise performance based upon feedback from teachers and/or peers	Exergames, digital video camera

Application.

Activity Type	Brief Description	Possible Technologies
Demonstrate/teach a physical fitness concept or principle	Students communicate their understanding of a fitness concept or principle	Digital camera, digital video camera, presentation software, realtime data collection tools
Create an exercise or exercise routine	Students create a series of movements to address a particular fitness concept and perform them	Digital camera, digital video camera, presentation software, Web sites, Web authoring software
Maintain a personal fitness program	Students incorporate fitness-related components in a conditioning program	Exergames

Motor Skill Development

Motor skill development activity types reflect three stages of motor skill acquisition: cognitive (understanding), stage associative (practice), and stage autonomous (automatic) learning (Fitts & Posner, 1967). Combining and sequencing the activities below can help students to understand, acquire, practice, and perform motor skills automatically.

Cognitive. The overall purpose of cognitive activities in physical education is to help students understand movement concepts, principles, and strategies, which aids the development of motor skills and performance of sports and other types of physical activities.

Knowledge development.

Activity Type	Brief Description	Possible Technologies
Read text	Students extract information from paper-based and digital resources	Web sites, electronic books, online databases
Take notes	Students record information from lecture, live or recorded game, video, presentation, group work	Word processor, mobile device, tablet, wiki
View images	Students examine still images/objects; print-based or digital format	Document camera, digital camera, Web sites

View a demonstration	Students gain information from teachers, guest speakers, and peers; moving images/objects (videos, animations); synchronous/asynchronous; in-person or multimedia	Presentation software, video, Web-based virtual demonstrations
Explore/examine concepts, rules, and/or strategies	Students gather information/conduct research using print-based and digital sources	Web search engines, content-specific interactive tools
Ask questions	Students develop questions related to course material/concepts	Word processor, wiki
Answer questions	Students respond to teacher, peer, written, or digitally posed questions	Word processor, quiz software, student response system, discussion boards, wiki
Discuss	Students engage in dialogue with one or more peers; synchronous/asynchronous	Discussion board, email, text message, videoconferencing
Take a quiz/test	Students respond to questions on a test or quiz	Word processor, quiz software, Web sites, student response system
Create a representation	Students develop a representation of a movement concept or skill (in text, images, presentation, concept map, etc.).	Drawing software, concept mapping software, presentation software, digital video camera
Create a game	Combine rules, strategies, and motor skills to form a new way to play a game	Drawing software, concept mapping software, word processor, digital video camera
Plan for collaboration in a game situation	Students develop a strategy or game plan to address specific goals	Concept mapping software, word processor, spreadsheet

Knowledge application.

Activity Type	Brief Description	Possible Technologies
Do movement analysis	Students assess movement patterns and/techniques to improve performance	Movement analysis software
Generate/collect data	Students generate data by performing motor skill	Realtime data collection tools, content-specific assessment software
Analyze data	Students compare and contrast data collected against criteria and/or previous analyses (e.g. proper techniques)	Spreadsheet, mobile device, movement analysis software
Observe and evaluate self and/or peers	Students observe and analyze their own or a peer's performance.	Digital camera, digital video camera, content-specific assessment software, realtime data collection tools
Provide feedback & recommendations	Students communicate the results of performance analysis and provide recommendations to improve motor skills.	Word processor, videoconferencing, audiorecorder, discussion fora
Set goals	Students determine appropriate motor goals based upon observations and/or movement analysis.	Word processor, content-specific assessment software
Plan a training program	Students design a training program for skill development and/or improvement based upon self/peer evaluation	Digital camera, digital video camera, presentation software, Web sites, Web authoring software

Psychomotor. Psychomotor learning activity types focus on practicing and applying motor skills that lead to the automatic performance of those skills. The sequence of these activities—in that they appear following the knowledge-related activities described above—demonstrates how students can engage in activities to understand, acquire, practice, and perform appropriate exercises to improve motor skill performance.

Practice.

Activity Type	Brief Description	Possible Technologies
Imitate/execute the mechanics of a motor skill	Students imitates specific skill mechanics over and over to address a particular motor skill (e.g. stance, follow-through, etc.)	Digital video camera, Web sites, Exergames
Refine the performance of each part of the motor skill	The students practice parts of a motor skill separately. (e.g. a spike in volleyball can be broken down into run up, stepping, jumping and striking).	Digital video camera, movement analysis software, Exergames
Combine parts of a motor skill in a sequence	Students practice the whole motor skill (e.g. a spike in volleyball)	Exergames
Adjust the sequence the motor skill	Students make corrections to the performance of a motor skill in response to feedback	Digital video camera, movement analysis software

Automatic performance.

Activity Type	Brief Description	Possible Technologies
Perform a motor skill automatically	Students practice of one or more motor skills without thinking	Exergames
Participate in a game	Students select and apply specific sports' tasks (e.g. motor skills), rules, and/or strategies in an individual or team-based game-play situation	Exergames
Collaborate and strategize in a game	Students work as a team to apply relevant knowledge and skills during a controlled game-play situation	Exergames
Modify & adapt performance	Students revise, consider, and make changes to a performance based upon feedback from teachers and/or peers	Exergames, digital video camera
Demonstrate/teach the mechanics of a skill	Students share their understanding of a game concept or principle	Digital camera, digital video camera, presentation software, realtime data collection tools

References

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