

III-B. Physical Education Findings and Recommendations

This section contains findings and recommendations related to the internal quality review, the external referent reviews, and the review of 21st Century Skills and PWR Skills for physical education. Detailed review criteria can be found in the Methodology section of this report. A brief description of the criteria and guiding questions also are provided here for convenience.

Internal Quality Review

As described in the Methodology section of this report, the Colorado MCS were reviewed for their quality according to four criteria: depth, coherence, rigor, and breadth. The scale used for evaluating each criterion was as follows: Fully (F), Partially (P), No (N), or Insufficient information to determine (I). Findings from these analyses are presented below.

Depth

Ratings for depth are assigned based on the questions below.

- Do the benchmarks describe content of sufficient and appropriate depth in the standard *within each grade span*? (For example, is the depth of content of the standard appropriate for a school year?)
- Do the benchmarks describe content of sufficient and appropriate depth in the standard *across the grade spans*?

The table below shows the ratings for depth in the physical education standards, reported for each standard at each grade span, as well as across the grade spans. The across grade span ratings are holistic ratings of the depth of the standards in K–12.

Table 9. Ratings for Depth in the Physical Education MCS

Standard	K–4	5–8	9–12	Across Grade Spans
1	P	F	P	P
2	N	I	F	P
3	F	F	F	F

(F=Fully; P=Partially; N=No; I=Insufficient Information)

As Table 9 shows, standards 1 and 2 are rated as Partially across the grade spans for depth. Standard 3 is rated as Fully across the grade spans. The ratings for each standard within the grade spans are discussed below. Areas for improvement are also discussed below.

Standard 1

Standard 1 for physical education requires students to demonstrate competent skills in a variety of physical activities and sports. Standard 1 is rated as Partially across the grade spans for depth. This rating is primarily because the standard does not provide adequate detail, depth of skill mastery, or content development across the grade spans. Grade span K–4 is rated as Partially for depth. The level of depth is appropriate for grade levels K–2, but not for grade levels 3–4. The demonstration of even locomotor movements, such as walk, run, leap, hop, and uneven locomotor movements is appropriate for grade levels K–2. The demonstration of the transfer of weight, change of direction, and fundamental manipulative skills are also appropriate for the K–2 grade levels, but not for grade levels 3–4. For this grade span, students can make greater advancement in physical ability, motor skill development, and cognitive understanding of actions, behavior, and strategy than indicated. Standard 1 is rated as Fully for grade span 5–8. The grade span bullets provide adequate guidance to reach the benchmarks, outlining the depth of development and understanding in modified net games and invasive games; individual, team and dual sports/activities; and dance movement. Standard 1 is rated as Partially for grade span 9–12. Much of the detail in the grade span bullets repeats information from grade span 5–8. Nevertheless, the grade span bullets indicate only partial depth for these grades. Competency in one team-related activity, one individual activity, and one dual activity does not provide adequate depth to the standard. Moreover, “competency” is not sufficiently defined.

Standard 2

Standard 2 for physical education requires students to demonstrate competency in physical fitness. It is rated as Partially for depth across the grade spans. At grade span K–4, it is rated as No. There is a lack of sufficient depth for the grade span. Two of the grade span bullets address body alignment, but they require more explanation and depth. For example, the standard should require students to understand how heart beats change depending on the rigor of exercise. At grade span 5–8, standard 2 is rated as Insufficient Information. The wording and terminology used to describe the standard for this grade span are not adequate to provide a clear understanding of depth. Some of the grade span bullets appear ambiguous (e.g., “demonstrating how physical fitness increases wellness”) and others appear to be contradictory (e.g., “participating in . . . anaerobic activities to attain cardiovascular endurance”). Moreover, there is a disconnect between the standards benchmarks and the grade span bullets. All of the grade span bullets state “demonstrate” or “participate” but there is no guidance on how knowledge is gained or assessed. Greater clarity within the standard is needed to determine if the standard, the benchmarks, and grade span bullets are at the appropriate depth. Standard 2 at grade span 9–12 is rated as Fully for depth. The grade span bullets relate back to benchmarks and clearly outline sufficient depth of understanding and content to be addressed. The bullets are also clear and concise.

Standard 3

Standard 3 for physical education requires students to demonstrate the knowledge of factors important to participation in physical activity. Standard 3 is rated as Fully across the grade spans for depth. It encompasses the “knowledge” required for physical

education, including game/sport related rules and strategies, skill-development principles, biomechanics, and physiology. It also includes social interaction (teamwork, cooperation) and goal setting. Standard 3 is rated as Fully within each of the grade spans. For grade span K–4, the standard incorporates not only game knowledge. It also includes sportsmanship, strategies, health benefits, cultural backgrounds of activities, skill development principles, and game design. For 5–8, the standard incorporates not only physiology, substance abuse, fitness principles, and physiology. It also includes teamwork principles, game strategy, self-analysis, and injury prevention. For 9–12, the standard incorporates not only cooperation but teamwork and strategy skills/understanding. It also includes game rules/regulations, cultural/historical background of activities, biomechanics, physiology, and injury prevention.

Coherence

Ratings for coherence are assigned based on the questions below.

- Are the benchmarks for each standard sequenced appropriately across the grade spans? (For example, do they scale or spiral appropriately across the grade spans?)
- Do the benchmarks begin and end at appropriate points in the content?

The tables below show the ratings for coherence in the physical education standards, reported as appropriate sequence across the grade spans, and as appropriate beginning and endpoints for each standard at each grade span, as well as across the grade spans.

Table 10. Ratings for Coherence in the Physical Education MCS

Standard	Appropriate Sequence Across Grade Spans
1	P
2	P
3	F

(F=Fully; P=Partially; N=No; I=Insufficient Information)

Table 11. Ratings for Coherence in the Physical Education MCS

Standard	Appropriate Beginning and Endpoints			Across Grade Spans
	K–4	5–8	9–12	
1	P	F	P	P
2	I	P	F	P
3	F	F	F	F

(F=Fully; P=Partially; N=No; I=Insufficient Information)

As Tables 10 and 11 show, standards 1 and 2 are rated as Partially across the grade spans for coherence. Standard 3 is rated as Fully across the grade spans for coherence. The ratings for each standard within the grade spans are discussed below. Areas for improvement are also discussed below.

Standard 1

Standard 1 is rated as Partially across the grade spans for coherence. Standard 1 is rated as Partially for grade span K–4. The end points are appropriate for a grades K–2, but not for grades 3 and 4. The endpoints for K–4 should include more advanced skills such as creating sequences, demonstrating changes of pathways, levels, force and direction with manipulatives, creating and demonstrating a variety of gymnastic patterns, such as rolling and inversion, and a variety of jump-rope skills. Standard 1 is rated as Fully for 5–8. It has appropriate sequence and end points, concentrating upon a range of activities and sports. It is rated as Partially for 9–12. The end points for the standard stop at competency in a small range of activities and do not provide adequate scope for students to develop skills related to a variety of activities and sports.

Standard 2

Standard 2 is rated as Partially across the grade spans for coherence. At grade span K–4, standard 2 is rated as Insufficient Information. The grade span bullets do not provide clear beginning and end points to determine a rating. Although the standard benchmarks are appropriate, more clarity and explanation is required from the corresponding grade span bullets to adequately assess coherence. At grade span 5–8, standard 2 is rated as Partially for coherence due to an issue of emphasis at the beginning and end points. There is too much emphasis on technique instead of on participation, demonstration, or knowledge. The standard and benchmarks are appropriate. However, the corresponding grade span bullets do not adequately reflect or expand on the benchmarks. Standard 2 is rated as Fully for grade span 9–12. The grade span bullets for 9–12 are sufficient. They outline appropriate start and end points, and the bullets are reflective of the standard and benchmarks.

Standard 3

Standard 3 is rated as Fully across the grade spans for coherence. Within each of the grade spans, the standard is also rated as Fully for appropriate beginning and endpoints.

Rigor

Ratings for rigor are assigned based on the questions below.

- Do the benchmarks describe content and skill expectations of a reasonable and appropriate level for this grade span?
- Do the standards and benchmarks communicate an appropriate level of rigor?

The table below shows the ratings for rigor in the physical education standards, reported for each standard at each grade span, as well as across the grade spans.

Table 12. Ratings for Rigor in the Physical Education MCS

Standard	K–4	5–8	9–12	Across Grade Spans
1	P	P	I	P
2	F	F	F	F
3	F	F	F	F

(F=Fully; P=Partially; N=No; I=Insufficient Information)

As Table 12 shows, standard 1 is rated as Partially across the grade spans for rigor. Standards 2 and 3 are rated as Fully across the grade spans for rigor. The ratings for each standard within the grade spans are discussed below. Areas for improvement are also discussed below.

Standard 1

Standard 1 is rated as Partially across the grade spans for rigor. The rating for grade span K–4 is rated as Partially. The rigor of the standard is insufficient for the entire grade span. It is appropriate for grade levels K–2 but not for grade levels 3 and 4. By the end of the grade span, students should be able to demonstrate more advanced skills. Standard 1 is rated as Partially for 5–8. The standard is not sufficiently rigorous. The expectations and requirements of the grade span bullets are general and too easily attainable. The rating of the standard for 9–12 is Insufficient Information. There is not enough information to determine a rating. Although competency in a minimum of three activities is stated, it is unclear how competency is defined.

Standard 2

Standard 2 is rated as Fully across and within the grade spans for rigor. The rigor of the skills is appropriate at each grade span. “Performing aerobic and anaerobic self-testing activities” is appropriate for K–4. “Participating in a variety of aerobic and anaerobic activities to attain cardiovascular endurance” is appropriate for 5–8, and “sustaining and maintaining a moderate aerobic activity to achieve cardiovascular benefits” is appropriate for 9–12. Although not essential, the rigor of the standard at grade span 9–12 could be increased by developing varying training programs for different forms of fitness (e.g., flexibility, endurance, power, weight management).

Standard 3

Standard 3 is rated as Fully across the grade spans for rigor. This standard is inclusive of many aspects, content areas, and skill sets. In comparison to standards 1 and 2, this standard is far more rigorous across the grade spans. Standard 3 is rated as Fully across the K–4 grade span for rigor. It incorporates content and skill appropriate for all of the K–4 grade levels. Standard 3 is rated as Fully across the 5–8 grade span. It incorporates content and skill appropriate throughout the grade span. Grade span bullets outline the high level of rigor expected in the areas of substance abuse, personal fitness, physiology and motor learning principles, game design, rules, sportsmanship, game and activity origin; and an understanding of one’s own movement development. Standard 3 is rated as Fully for 9–12. The grade span incorporates rigor across several knowledge areas, including group dynamics, complex game strategies, cultural and historical origins, activity selection for criteria, injury prevention, and biomechanics.

Breadth

Ratings for breadth are assigned based on the questions below, each of which is reported in a separate table.

- Do the benchmarks describe sufficient and appropriate breadth of content across standards *within each grade span*?
- Do the benchmarks contain the essential content for this subject *within and across grade spans*?
- Are the benchmarks free from extraneous content *within and across grade spans*? If not, what content is extraneous?

Each of the three aspects of breadth examined is reported in a separate table in order to distinguish between essential and extraneous content.

Breadth represents the sufficiency of content across the standards. The table below shows the ratings for overall breadth *across* the physical education standards within each grade span and across the grade spans.

Table 13. Ratings for Overall Breadth in the physical education MCS

Grade Span	Across Standards
K-4	P
5-8	F
9-12	P
Across Grade Spans	P

(F=Fully; P=Partially; N=No; I=Insufficient Information)

As Table 13 shows, grade span K-4 is rated as Partially across the standards for overall breadth. Grade span 5-8 is rated as Fully across the standards for overall breadth. Grade span 9-12 is rated as Partially across the standards for overall breadth. Individual grade spans are discussed below.

Grade span K-4

Grade span K-4 is rated as Partially across the standards for overall breadth. The breadth is too narrow for standards 1 and 2; however, standard 3 is too broad and covers too much content. Overall breadth across the standards is partial as they are adequate for K-2 and not sufficient for 3-4.

Grade span 5-8

Grade span 5-8 is rated as Fully across the standards for overall breadth. Breadth is full without extraneous content except for standard 3, which is broad and has too many benchmarks, bullets, and content areas. In comparison to the other grade spans, the amount of extraneous content is not as great at grade span 5-8. When the three standards are viewed across the grade span, the breadth is sufficient.

Grade span 9–12

Grade span 9–12 is rated as Partially across the standards for overall breadth. Across the grade span, the breadth of the standards is limited. Areas for greater breadth exist (e.g., activity content areas, skill development, varying forms of fitness). Standard 3 has extraneous content, making it too broad. The standard has too many benchmarks, bullets, and content areas.

The table below shows the breadth ratings for essential content in the physical education standards, reported for each standard at each grade span, as well as across the grade spans.

Table 14. Ratings for Breadth—Essential Content in the Physical Education MCS

Grade Span	1	2	3	Across Standards
K–4	P	I	F	P
5–8	P	P	F	P
9–12	N	F	F	P
Across Grade Spans	P	P	F	P

(F=Fully; P=Partially; N=No; I=Insufficient Information)

As Table 14 shows, the grade spans are rated as Partially across the standards for breadth—essential content. Grade span K–4 is rated as Partially across the standards for essential content. Grade span 5–8 is rated as Partially across the standards for essential content. Grade span 9–12 is rated as Partially across the standards for essential content. Each grade span is discussed below. Areas for improvement are also discussed below.

Grade Span K–4

Grade Span K–4 is rated as Partially across the standards for essential content. The grade span is rated as Partially at standard 1. The benchmarks and grade span bullets relating to the standard are too narrow. The grade span is rated as Insufficient Information at standard 2. There is insufficient information to rate the breadth for essential content. The grade span bullets are unclear about breadth of the standard and benchmarks. The grade span bullets do not appropriately match the benchmark bullets to indicate the breadth of the standard at the grade span. The grade span is rated as Fully at standard 3. It contains all of the essential content.

Grade Span 5–8

Grade span 5–8 is rated as Partially across the standards for essential content. The grade span is rated as Partially at standard 1. It includes relevant content areas such as defensive and offensive strategy in a variety of modified and invasion games, but dance should also be included, as this is typically considered essential physical education content.⁹ The grade span is rated as Partially at standard 2 for containing essential content. The grade

⁹ Although Colorado does address the relationship between fitness and dance in the MCS for dance (standard 5), this finding is based solely on the review of the MCS for physical education.

span outlines some key content areas, but would be improved with additional breadth. The grade span focuses on demonstrating techniques regarding some fitness aspects (e.g., warming up/flexibility). Not enough attention is devoted to other techniques (e.g., display knowledge of how to increase cardiovascular endurance). The grade span is rated as Fully at standard 3. It contains all of the essential content.

Grade Span 9–12

Grade span 9–12 is rated as Partial across the standards for containing essential content. The grade span is rated as No at standard 1. The standard is too narrow and ignores areas of physical activity that could be incorporated (e.g., recreation/gymnastics; outdoor education). Dance could also be included in physical education. The grade span is rated as Fully at standard 2. It has sufficient breadth across content. The grade span is rated as Fully at standard 3. It contains all of the essential content.

The table below shows the breadth ratings for freedom from extraneous content in the physical education standards, reported for each standard at each grade span, as well as across the grade spans.

Table 15. Ratings for Breadth—Free of Extraneous Content in the Physical Education MCS

Grade Span	1	2	3	Across Standards
K–4	F	F	P	F
5–8	F	F	P	F
9–12	F	F	P	F
Across Grade Spans	F	F	P	F

(F=Fully; P=Partially; N=No; I=Insufficient Information)

As Table 15 shows, the grade spans are rated as Fully across the standards for breadth—free of extraneous content. Grade span K–4 is rated as Fully across the standards for being free of extraneous content. Grade span 5–8 is rated as Fully across the standards for being free of extraneous content. Grade span 9–12 is rated as Fully across the standards for being free of extraneous content. Each grade span is discussed below. Areas for improvement are also discussed below.

Grade Span K–4

Grade span K–4 is rated as Fully across the standards for being free of extraneous content. The grade span is rated as Fully at standards 1 and 2. There is no extraneous content. The grade span is rated as Partially at standard 3. The grade span is too broad at this standard. Incorporating all knowledge of factors important to participation in physical activity into this standard could result in some content being overlooked.

Grade Span 5–8

Grade span 5–8 is rated as Fully across the standards for being free of extraneous content. The grade span is rated as Fully at standard 1. It contains no extraneous content. The grade span is rated as Fully at standard 2. However, there is some minor extraneous

content that is not relevant to this standard (e.g., safety factors). The grade span is rated as Partially at standard 3. The grade span is too broad at this standard. Incorporating all knowledge of factors important to participation in physical activity into this standard could result in some content being overlooked.

Grade Span 9–12

Grade span 9–12 is rated as Fully across the standards for being free of extraneous content. The grade span is rated as Fully at standards 1 and 2. It contains no extraneous content. The grade span is rated as Partially at standard 3. The grade span is too broad at this standard. Incorporating all knowledge of factors important to participation in physical activity into this standard could result in some content being overlooked.

External Referent Review

As described in the Methodology section of this report, analysts reviewed four sets of content standards to serve as an external referent comparison with Colorado’s MCS for physical education. Given the state’s intention to combine physical education and health content in the new standards, at the CDE’s request, both physical education and health standards were included in the review. The following documents were used as external referent standards for the physical education review:

- Massachusetts Comprehensive Health Curriculum Framework (October 1999)
- North Carolina Standard Course of Study, Healthful Living Performance Standard Course of Study (2006)
- Finland
 - National Core Curriculum for Basic Education 2004, Physical Education (Finland)
 - National Core Curriculum for Upper Secondary Schools 2003, Physical Education (Finland)
- Singapore
 - Physical Education Syllabus (Primary, Secondary, Pre-University), 2006, (Singapore)
 - Health Education Syllabus for Primary Level 2007, (Singapore)

These external referent standards were reviewed for two broad criteria, organization/structure and content. Each criterion contained several subcategories about which analysts recorded observations before determining a final overall holistic rating of mostly similar (Similar) or mostly different (Different). Findings from these analyses are presented below, first with a summary of findings across the external referents. This is followed by four sections detailing the findings of the review for each referent.

The table below summarizes the holistic external referent standards in comparison with Colorado’s MCS.

Table 16. Holistic Comparison Ratings for Physical Education External Referents

Rating Category	Massachusetts	North Carolina	Finland	Singapore
Organization/ Structure	Different	Different	Different	Different
Content	Similar	Different	Similar	Different

The holistic ratings above reflect the analyst’s judgment that in all of the four external referent standards there are more differences than similarities with Colorado’s MCS in organization/structure. In content, the holistic ratings above show that in two of the four referent standards there are more differences than similarities overall with Colorado’s MCS. There are also more similarities than differences overall in content between Colorado’s MCS and two of the referents. The analyses below highlight various similarities and differences between the MCS and pertinent categories in each referent’s documents. It is important to note that the referents have similarities and differences

among one another, as well as with Colorado's MCS. However, no one approach is intended to be presented as necessarily more or less effective than another. Differences in structure or content of a state or country's standards may be qualitative, but may also be attributable to differences in history, purpose, and/or context. Thus, the implication is that a variety of approaches and combinations of approaches may be considered, should they be determined to be appropriate for Colorado.

Organization and Structure

As indicated in Table 16, the organization/structure of the Colorado MCS for physical education differs significantly from the organization/structure of the external referents, based on the categories of grade articulation, hierarchy of standards, number of standards, and the design/format of the document. It should also be noted that the other frameworks have differences from each other and no two are generally similar, even though all have aspects that are repeated in others.

Grade Articulation

The Colorado MCS for physical education is organized into three grade spans, K–4, 5–8, and 9–12, across which the standards are spirally presented. This is similar to other frameworks, although two of those reviewed separate the elementary grade span into two smaller grade spans (e.g., K–2, 3–5). The other frameworks also articulate standards by grade spans instead of grade level. The only exception is the health framework of the *North Carolina Standard Course of Study, Healthful Living Performance*, which organizes standards by grade level up to high school, and the physical education framework of the *North Carolina Standard Course of Study, Healthful Living Performance*, which is separated by grade spans, but has specific grade-level objectives.

Hierarchy of Standards

The hierarchy of standards for the Colorado MCS differs from three of the four external referents. Colorado's MCS include standards supported by benchmarks, which in turn are supported by grade span bullets. The Colorado MCS is most similar to the *North Carolina Standard Course of Study, Healthful Living Performance*, which has standards for grade spans that are followed by benchmarks and explanatory bullets. The other three referents are different in standard hierarchy. *Massachusetts Comprehensive Health Curriculum Framework*, for example, is primarily a health syllabus with physical activity and fitness as 1 of 4 standards under the physical health strand. The other external referent documents have hierarchies based on strands, then benchmarks or objectives, which are followed by learning outcomes.

Number of Standards

The number of standards for the Colorado MCS for physical education differs from three of the four external referents. The number of standards differs among each external referent document. The Colorado MCS has only three standards, with three benchmarks, and 20 or more benchmark bullets per grade span. It is most similar to the *North Carolina Standard Course of Study, Healthful Living Performance*, which has six and another five for health. The *Massachusetts Comprehensive Health Curriculum Framework* is predominantly a health syllabus with four strands and fourteen standards. By contrast,

The Singapore Physical Education Syllabus has six learning objectives, four to seven learning outcomes, and 10–102 content bullets per learning outcome.

Design/Format

The design and format of the Colorado MCS differ from all four of the external referents. It has an introduction, standards, a glossary, an index, and a reference section. Each external referent document is different, with stark differences even between the health and physical education sections for the same framework (e.g., the *North Carolina Standard Course of Study, Healthful Living Performance* and Singapore’s Physical Education Syllabus and Health Education Syllabus). The design of the frameworks can enhance understanding and utility, if they follow a logical structure. A good example of this is Finland’s *National Core Curriculum*, which, even though it lacks in detail, is logical and follows a clear path from rationale to benchmarks.

Content

The content of the Colorado MCS has a number of similarities and differences with the content in the standards of the external referents. The major difference between the Colorado MCS and the other documents is that there is less emphasis in the Colorado MCS on personal and group skills, understandings, and behavior necessary during group activity and physical education. All four reviewed documents dedicate standards and specific benchmarks to personal and social skills. It is an area that the current Colorado MCS touches upon, but does not address or target as much as the other documents. One of the three health dimensions for Singapore’s Health Education Syllabus is emotional and psychological health. Finland’s *National Core Curriculum* has specific objectives that pertain to fair play, cooperation, self-perception/assessment, group work, and diversity. The *Massachusetts Comprehensive Health Curriculum Framework* sets social and emotional health as one of four strands. The *North Carolina Standard Course of Study, Healthful Living Performance* addresses self-confidence, self-management, mental health, and decision making.

Standard 1

Standard 1 for physical education requires students to demonstrate competent skills in a variety of physical activities and sports, with varied depth across grade spans. The external referent documents address similar content, such as skill development, but add greater context and purpose to the standard. For example, the *North Carolina Standard Course of Study, Healthful Living Performance* includes self-confidence. Singapore’s Physical Education Syllabus and Finland’s *National Core Curriculum* address fair play and teamwork. The *Massachusetts Comprehensive Health Curriculum Framework* addresses social conduct.

Standard 2

Standard 2 for physical education requires students to demonstrate competency in physical fitness. The external referent documents are broader at the standard than the Colorado MCS. The *North Carolina Standard Course of Study, Healthful Living Performance*, for example, provides greater emphasis on fitness responsibility. Singapore’s Physical Education Syllabus addresses self-esteem. Finland’s *National Core*

Curriculum also addresses self-perception and self-assessment. The *Massachusetts Comprehensive Health Curriculum Framework* includes wellness and decision making.

Standard 3

Standard 3 for physical education requires students to demonstrate the knowledge of factors important to participation in physical activity. The Colorado MCS has less breadth than the external referent documents at standard 3. Because it encompasses the “knowledge” required for physical education—including game/sport related rules, strategies, skill development principles, biomechanics, physiology, as well as social interaction (teamwork, cooperation) and goal setting—it is a broad, deep, and all encompassing standard. The external referent documents have more standards and, therefore, elaborate on more aspects pertinent to physical education such as fair play, cooperation, self-perception/assessment, group work, and diversity.

Grade Spans

The Colorado MCS is more similar than different in emphasis compared with some of the external referent documents. Grade spans are similar to some other reviewed frameworks. The most obvious difference is that the elementary grade span for the Colorado MCS currently incorporates a large K–4 span. A couple of the external referent documents, but not all, divide the elementary grades into two grade spans (K–2 and 3–5). As a result, those two documents provide greater specificity and guidance at the comparative K–4 grade span.

Wording/Specificity

The Colorado MCS has some ambiguous wording and does not consistently provide a clear path from the rationale through the standards, benchmarks, and grade span bullets. Greater attention to providing consistent language would make clearer the expectations in the standards. The external referents are much clearer in demonstrating a path between strands, standards, and benchmarks. For instance, Finland’s *National Core Curriculum* framework, though shorter in length than the Colorado MCS, provides a clearer connection from the rationale through the benchmarks primarily due to accurate and concise wording.

The sections that follow provide detailed discussions of the similarities and differences between each external referent and the Colorado MCS, elaborating on the overview in the preceding section.

Massachusetts

Organization and Structure

The organization/structure of the Colorado MCS and the *Massachusetts Comprehensive Health Curriculum Framework* are more different than similar. In general, this difference is because the *Massachusetts Comprehensive Health Curriculum* is primarily a health curriculum framework instead of a physical education curriculum framework. Physical activity and fitness is one of four standards under the physical health strand. Altogether, there are fourteen topics in the four strands. The Colorado MCS, in contrast, are physical education standards. Nevertheless, the physical activity and fitness section of the *Massachusetts Comprehensive Health Curriculum* has some similarities with the Colorado MCS.

Grade Articulation

Similar to the Colorado MCS, the *Massachusetts Comprehensive Health Curriculum* articulates its standards by grade spans, which are 1–5, 6–8, and 9–12. As a result, like the Colorado MCS, the *Massachusetts Comprehensive Health Curriculum* restricts the attention to detail that can be provided to student development in physical education, especially in the elementary grades.

Hierarchy of Standards

The hierarchy of standards is mostly different between the Colorado MCS and the *Massachusetts Comprehensive Health Curriculum*. This difference is mainly because the latter is primarily a health curriculum framework. Unlike the Colorado MCS, it is organized by strand, standard, and learning standard. The *Massachusetts Comprehensive Health Curriculum* provides an effective health framework, incorporating personal and community health, safety and prevention, social and emotional health, in addition to physical health.

Number of Standards

The number of standards is mostly different between the Colorado MCS and the *Massachusetts Comprehensive Health Curriculum*. The latter has four strands, 14 standards, and up to seven learning standards for each standard. As mentioned earlier, physical activity and fitness is only one of four standards under the physical health strand, which is one of 14 topics within the four strands.

Design/Format

The Colorado MCS and the *Massachusetts Comprehensive Health Curriculum* are mostly different in their design and format. Although each document presents its standards through spiral organization across grade spans, there are significant differences in the design and format of the two documents. The Colorado MCS provides an introduction, followed by standards, a glossary, an index, and a references section. Altogether, it is 19 pages. The *Massachusetts Comprehensive Health Curriculum* is a far larger and more detailed document. It has greater structure, length, and detail than the Colorado MCS. In addition to an introduction and a standards section, it includes sections on core concepts, guiding principles, and considerations in health education. It also provides appendices,

such as the Massachusetts guiding principles, laws and policy around health and health education, and technology literacy and health education. It is 102 pages.

Content

Although the *Massachusetts Comprehensive Health Curriculum* covers much more content than the Colorado MCS, the two documents are mostly similar in emphasis in the area of physical activity. The content of the *Massachusetts Comprehensive Health Curriculum* corresponds to the three standards of the Colorado MCS. However, it expands on the content scope of Colorado MCS standard 3 to incorporate personal and social competency standards/benchmarks. Additionally, the relevant content knowledge for each standard is fully incorporated into it, rather than placed in a separate “knowledge” standard, as the Colorado MCS does with standard 3.

Standard 1

The *Massachusetts Comprehensive Health Curriculum* motor-skill development learning standards are similar in emphasis to Colorado MCS standard 1. Each document addresses the content area of skill development, including motor skills, manipulative skills, sport or activity-specific skills. There is similar depth in the Colorado MCS benchmarks and the *Massachusetts Comprehensive Health Curriculum* learning standards. Each document focuses on similar content and skills, and covers similar grade spans.

Standard 2

The *Massachusetts Comprehensive Health Curriculum* fitness learning standards are similar in emphasis to the Colorado MCS standard 2. Each document targets the area of fitness, and focus on student activity, warm up, and cool down. However, the *Massachusetts Comprehensive Health Curriculum* provides more attention to explanations of wellness, behaviors that relate to fitness, and decision making. As a result the standard is broader for the *Massachusetts Comprehensive Health Curriculum* and combines essential knowledge alongside activity.

Standard 3

The *Massachusetts Comprehensive Health Curriculum* standards are mostly different in emphasis compared to Colorado MCS standard 3. Colorado MCS standard 3 focuses on “knowledge” required throughout physical activity, including strategy, skill development principles, and fitness principles. The *Massachusetts Comprehensive Health Curriculum* incorporates these aspects into the standards on skill development and fitness. It also adds personal and social competency to physical education, which is not evident in Colorado MCS standard 3. Many of the concepts covered in Colorado MCS standard 3 are also covered in the *Massachusetts Comprehensive Health Curriculum* (e.g., strategies, benefits of activity, personal responsibility). However, the *Massachusetts Comprehensive Health Curriculum* includes them in other standards, such as the social and emotional health strand (e.g., mental health, family life, and interpersonal relationships).

Grade Spans

The Colorado MCS is similar to the *Massachusetts Comprehensive Health Curriculum Framework* in coverage of content at grade span K–4. Each covers physical activity and fitness learning standards at the grade span, focusing on motor skills development and introduction to fitness concepts. However, the *Massachusetts Comprehensive Health Curriculum* also incorporates social and individual conduct into this grade span. Nevertheless, whereas the *Massachusetts Comprehensive Health Curriculum* provides greater scope and breadth of content than the Colorado MCS, neither document sufficiently addresses growth and development through physical education, because it does not articulate skills more specifically at grades K–4.

The Colorado MCS is similar to the *Massachusetts Comprehensive Health Curriculum* grade span 5–8 physical activity and fitness learning standards 2.8–2.13. Both the Colorado MCS and the *Massachusetts Comprehensive Health Curriculum* focus on expanding activities, developing sequences, and increasing difficulty of skill development. The *Massachusetts Comprehensive Health Curriculum*, however, provides benchmarks, guidance and explanation of wellness, behaviors that relate to fitness, and decision making. The *Massachusetts Comprehensive Health Curriculum* learning standards 2.14–2.16 also emphasize social competency, strategies, and inclusion.

Grade span 9–12 of the Colorado MCS is similar to the grade span 9–12 physical activity and fitness learning standards 2.17–2.23 of the *Massachusetts Comprehensive Health Curriculum*. The *Massachusetts Comprehensive Health Curriculum* is similar to the Colorado MCS with regard to physical competence in a variety of activities, knowledge of warm up/cool down, and increasing understanding of fitness related knowledge and activities. However, the *Massachusetts Comprehensive Health Curriculum* provides additional emphasis upon social competency, lifelong participation, strategies, inclusion, and leadership (2.24–2.27).

Overall, the Colorado MCS grade spans are similar to the corresponding grade spans of the *Massachusetts Comprehensive Health Curriculum* physical activity and fitness learning standards with regard to motor skills and fitness. Nevertheless, the *Massachusetts Comprehensive Health Curriculum Framework* has additional learning standards across the grade spans, focusing on social competency.

The *Massachusetts Comprehensive Health Curriculum* has more breadth and depth than the Colorado MCS, addressing the strands of personal and community health, safety and prevention, and social and emotional health. The *Massachusetts Comprehensive Health Curriculum* has three overarching Strands: Physical Health, Social and Emotional Health, and Safety and Prevention. These are then separated into K–12 standards. Strand 1 covers Growth and Development, Physical Activity and Fitness, Nutrition, and Reproduction/Sexuality. Strand 2 covers Mental Health, Family Life, and Interpersonal Relationships. Strand 3 covers Disease Prevention and Control, Safety and Injury Prevention, and Tobacco, Alcohol and Other Substance Use/Abuse Prevention.

Wording/Specificity

Both the Colorado MCS and the *Massachusetts Comprehensive Health Curriculum* address similar topics and use similar wording. Yet there is more detail and consistency in the wording of the *Massachusetts Comprehensive Health Curriculum* learning standards. A clearer progression is evident from the strand to standard to learning standard level in the *Massachusetts Comprehensive Health Curriculum* than in the Colorado MCS.

North Carolina

Organization and Structure

The organization/structure of the Colorado MCS and the *North Carolina Standard Course of Study, Healthful Living Performance* are more different than similar in emphasis.

The *North Carolina Standard Course of Study, Healthful Living Performance Standard Course of Study* is a comprehensive and appropriate physical education curriculum framework. It addresses all relevant content and skill areas. It possesses two grade span differentiations at elementary school grade span. It also provides a sound basis for developing both relevant personal and social skills through physical education for lifelong physical activity. However, the *North Carolina Standard Course of Study, Healthful Living Performance* does not include standards for physical education at grade span 9–12.

The *North Carolina Standard Course of Study, Healthful Living Performance* also has a comprehensive health framework, spanning from kindergarten through high school. Similar to the physical education framework, the health framework is detailed, specific, and sequenced with five overarching goals (standards) and grade level benchmarks/bullets up to high school. At high school, the standards are articulated by grade span.

Grade Articulation

Both the Colorado MCS and the *North Carolina Standard Course of Study, Healthful Living Performance* articulate their standards by three grade spans. The latter, however, separates its standards at the elementary grade span into two narrower grade spans: K–3 and 4–5. Its third grade span is 6–8. It does not have a high school grade span for physical education. Because the *North Carolina Standard Course of Study, Healthful Living Performance* differentiates its grade spans more narrowly at the lower grade levels, it allows for greater detail in the learning outcomes at those grade spans than the Colorado MCS.

The health framework of the *North Carolina Standard Course of Study, Healthful Living Performance* has designated benchmark bullets for each grade level K–8. At the high school grade levels it articulates the benchmark bullets by grade span (9–12).

Hierarchy of Standards

There are similarities and differences between the Colorado MCS and the *North Carolina Standard Course of Study, Healthful Living Performance* in their hierarchy of standards. The Colorado MCS has standards, followed by benchmarks and grade span bullets. The *North Carolina Standard Course of Study, Healthful Living Performance Standards* follows a similar path with skills, followed by competency goals, and competency goal bullets. The differences appear with regard to the extended range of content area and skills developed throughout the hierarchy, including movement forms, fitness and sports literacy, healthful lifestyles, personal fitness, and appreciation for diversity. Overall, the *North Carolina Standard Course of Study, Healthful Living Performance* has a logical

hierarchy of standards that captures more content, strands, and skills than the Colorado MCS. The hierarchy of standards in the health strand of the *North Carolina Standard Course of Study, Healthful Living Performance* is similar to that of the physical education strand.

Number of Standards

The *North Carolina Standard Course of Study, Healthful Living Performance* has more standards and benchmarks than the Colorado MCS. It has six standards and five benchmarks. The Colorado MCS, however, has a greater number of grade span bullets per benchmark. Nevertheless, the *North Carolina Standard Course of Study, Healthful Living Performance* displays greater clarity and consistency. The health strand of the *North Carolina Standard Course of Study, Healthful Living Performance* has five objectives, followed by competency goals and competency goal bullets.

Design/Format

Both the Colorado MCS and the *North Carolina Standard Course of Study, Healthful Living Performance* present their standards through spiral organization across grade spans, and are of similar length. The latter is 20 pages. The *North Carolina Standard Course of Study, Healthful Living Performance* is generally clearer and has a more concise layout. However, it does not have a clear pattern of influence or use for strands, skills, and benchmarks. It also does not have a glossary, reference section, or index.

Content

The content of Colorado MCS and the *North Carolina Standard Course of Study, Healthful Living Performance* are mostly different in emphasis. The difference between the two documents in content is mainly because the *North Carolina Standard Course of Study, Healthful Living Performance* addresses a greater range of skills and content areas.

Standards 1 and 2

The Colorado MCS and the *North Carolina Standard Course of Study, Healthful Living Performance* have some similarities at standards 1 and 2. Each emphasizes skill development and fitness, but the Colorado MCS does not incorporate the same emphasis upon personal or social interaction and skills. The *North Carolina Standard Course of Study, Healthful Living Performance* displays greater depth and breadth for both these standards. It also integrates grade specific objectives for each standard into the framework. The objectives provide greater depth for each standard (e.g., competency goal 8: “explore activities you like which require physical activity during non-school hours”).

Standard 3

The Colorado MCS and the *North Carolina Standard Course of Study, Healthful Living Performance* are mostly different in emphasis in standard 3. The *North Carolina Standard Course of Study, Healthful Living Performance* provides areas which are necessary for an effective physical education framework with emphasis on self-management and personal development (standard 3), fitness responsibility (standard 4), respect for diversity, social interaction, and teamwork (standard 5) and self-

confidence/positive self-image (standard 6). The *North Carolina Standard Course of Study, Healthful Living Performance* also provides greater breadth, incorporating additional standards and emphasis on social and personal development.

Although the Colorado MCS does not currently have any health standards, it is notable that the Health framework of the *North Carolina Standard Course of Study, Healthful Living Performance* includes growth and development, nutrition/diet, mental health, disease/hygiene, safety/injury prevention, and ATOD use/abuse prevention.

Grade Spans

Both the Colorado MCS and the North Carolina Standard Course of Study, Healthful Living Performance emphasizes movement, basic skills, and basic fitness at grades K–4. The differences are the weight that the latter places upon coping with stress/apprehension, behavior skills, personal choice in activity, and decision making. It separates the elementary grades into two spans: K–3 and 4–5. It also emphasizes group dynamics, personal development, and many aspects that can be future hindrances to lifelong physical activity.

Each document has similar emphasis on movement, basic skills, and basic fitness at grades 5–8. However, the *North Carolina Standard Course of Study, Healthful Living Performance* has a strong focus upon the personal and social development of its students, emphasizing self-esteem, teamwork, self-monitoring of fitness, diet, and goal-setting.

There are no standards in the *North Carolina Standard Course of Study, Healthful Living Performance* at grade span 9–12.

Wording/Specificity

The *North Carolina Standard Course of Study, Healthful Living Performance* has good use of appropriate verbs (e.g., develop movement control, demonstrate mature form, create and demonstrate, identify personal effort, identify likes/dislikes, create movement sequence, understand and apply strategy, etc.).

Finland

Organization and Structure

The organization/structure of the Colorado MCS and Finland's *National Core Curriculum* are more different than similar. This is generally due to different structures, the amount of detail and guidance provided, and the possibility of physical education as a specialized course in the upper secondary level of the *National Core Curriculum*.

Grade Articulation

The Colorado MCS and the *National Core Curriculum* have similar grade spans: K–4, 5–8, and 9–12. Grade span 9–12 in the *National Core Curriculum* is referred to as the upper secondary level. It has both compulsory and specialized elective courses. The compulsory courses are aimed at consolidating the skills and knowledge that students learned in prior grade spans. The courses are Skill and Condition and Individual and Group Training. The specialized elective courses include Recreational Exercise, Training Together, and Fitness Exercise.

Hierarchy of Standards

Even though the *National Core Curriculum* is shorter than the Colorado MCS, it provides more sections, including rationale, objectives, objective bullets, core content, core content bullets, and description of good performance benchmarks. This simple structure and pathway provides a clear guide to follow rationale through to performance benchmarks.

Number of Standards

The *National Core Curriculum* is different in the number of standards it has from the Colorado MCS. Unlike the Colorado MCS, it has one rationale, five to eight objectives per grade span, eight to nine core content bullets per grades span, and 12 descriptions of good performance benchmarks for grade spans 1–4 and 5–8.

Design/Format

The design and format of the Colorado MCS and the *National Core Curriculum* are more different than similar. Unlike the Colorado MCS, the *National Core Curriculum* is only a small section of a much larger curriculum document. The physical education section of the *National Core Curriculum* for basic education and the physical education section of the *National Core Curriculum* for upper secondary education are each three pages.

Content

The content of the Colorado MCS and the *National Core Curriculum* are more similar than different in emphasis. The latter however, provides less detail and description of content than the Colorado MCS. This brevity of detail and content specificity is evident throughout the *National Core Curriculum*.

Standards 1 and 2

Both the Colorado MCS and the *National Core Curriculum* emphasize skill and fitness for standards 1 and 2. Colorado MCS standard 1 is similar to the *National Core*

Curriculum objective 1 (grade span 1–4). Colorado MCS standard 2 is similar to the *National Core Curriculum* objective 2 (grade span 1–4). However, the Colorado MCS has more depth than the *National Core Curriculum* at these two standards. The corresponding standards of the *National Core Curriculum* are basic, leaving out both topics and themes, and do not provide sufficient detail.

Standard 3

The Colorado MCS and the *National Core Curriculum* are mostly different in emphasis at standard 3. Most of the content of the Colorado MCS is covered by the *National Core Curriculum* objectives although not in great depth. The *National Core Curriculum* objectives are basic, leaving out both topics and themes. They do not provide sufficient detail in knowledge of factors important to participation in physical activity. The *National Core Curriculum*, however, covers more content with its objectives, addressing fair play, cooperation, self-perception and assessment, group work, diversity, and outdoor education. There is also more than one standard in the *National Core Curriculum* that covers personal and social skills learning. As a result, although the Colorado MCS has more depth than the *National Core Curriculum*, the latter has more breadth at standard 3.

Grade Spans

Both the Colorado MCS and the *National Core Curriculum* emphasize motor skills and development of basic skills development at grades K–4. The *National Core Curriculum* also emphasizes fair play and cooperation. The *National Core Curriculum* has more precise benchmarks than the Colorado MCS, but lacks depth at the grade span.

Both the Colorado MCS and the *National Core Curriculum* emphasize the expansion of movement skills and sport-specific skills at grades 5–8. The *National Core Curriculum* also emphasizes self-perception, group work, diversity, and outdoor education. The *National Core Curriculum* emphasizes social skills and has more precise benchmarks than the Colorado MCS, but it lacks depth at this grade span.

At grades 9–12, both the Colorado MCS and the *National Core Curriculum* increase the emphasis on exercise, fitness, and specific skill development from the previous grade spans. The *National Core Curriculum* also emphasizes broadening forms of exercise and activity. The Colorado MCS narrows the breadth and increases the depth of the content. The *National Core Curriculum* also emphasizes social development and has more precise benchmarks than the Colorado MCS, but it lacks depth at this grade span.

The Colorado MCS and the *National Core Curriculum* are mostly different in content across the grade spans. The Colorado MCS grade spans have greater depth than the *National Core Curriculum*. The *National Core Curriculum* lacks specificity and detail in content. Differences in content between the two documents are generally similar across the grade spans, with the exception of emphasis on fair play, cooperation, self-perception, group work, diversity, and outdoor education in the *National Core Curriculum*.

Wording/Specificity

The physical education objectives for *National Core Curriculum* have greater specificity than the Colorado MCS. Although the objectives have content gaps, they are clear and consistent. However, they do not associate action verbs with the content bullets.

Singapore

Organization and Structure

The organization/structure of the Colorado MCS and the Singapore Physical Education Syllabus and Singapore Health Education Syllabus are more different than similar. The Singapore syllabi and the Colorado MCS articulate their standards by grade spans instead of grade level. However, differences appear between the structure of the frameworks and the number of standards. Overall, the Singapore syllabi provide more detail, specificity, and guidance than does the Colorado MCS.

Grade Articulation

The grade articulation is similar between the Colorado MCS and the Singapore syllabi. Each document articulates its standards by grade spans. The Singapore syllabi, however, have more grade spans. They organize their standards into six grade spans, which are called stages: Primary 2 (equivalent to K–2), Primary 3 (3–4), Primary 4 (5–6), Secondary 2 (7–8), Secondary 4/5 (9–10/11), and Pre-university 2/3 (10/11–12). The greater differentiation and specificity allows for a more detailed and useful framework at each grade span.

Hierarchy of Standards

The Colorado MCS and the Singapore syllabi are mostly different in their hierarchy of standards. The Singapore Physical Education Syllabus organizes its standards by learning objectives, key stage components, expected learning outcomes, and content bullets. The Singapore Health Education Syllabus is organized by dimensions, themes, objectives, and learning objectives. Overall, the Singapore syllabi provide a clear hierarchy of standards from learning objectives to expected learning outcomes. The Colorado MCS follows a less direct path from standards to benchmarks and rationale to bullets. Some grade span bullets are repeated from the benchmarks, and they generally provide less direction than the expected learning outcomes of the Singapore Physical Education Syllabus.

Number of Standards

Both the Colorado MCS and Singapore syllabi present their standards through spiral organization across grade spans. The Singapore Physical Education Syllabus has a greater number of objectives/standards, and benchmarks/expected learning outcomes than the Colorado MCS. The Singapore Physical Education Syllabus has six learning objectives, four to seven expected learning outcomes, seven key stage components, and 10 to 12 content bullets per expected learning outcome. The Singapore Health Education Syllabus has three health dimensions (Physical Health, Environment and Your Health, Emotional and Psychological Health), two to three themes per health dimension, seven objectives, and 25 learning objectives that align to each theme.

Design/Format

The Colorado MCS and the Singapore syllabi are more different than similar in their design and format. In addition to an introduction, a standards section, and a references section, the Singapore Physical Education syllabus also has sections which address the aims of physical education, the scope and selection of activities, a sample yearly plan, an assessment section, and a section that provides descriptors of overall grade earned. It is

50 pages. The Singapore Health Education Syllabus includes a methodology section, a planning scheme of work section, a section on teaching approaches, and an assessment section.

Content

The content of the Colorado MCS and the Singapore Physical Education Syllabus and Singapore Health Syllabus are also more different than similar. Although there are some similarities between the Colorado MCS and Singapore Physical Education Syllabus, a significant difference between the two documents is that the Singapore Physical Education Syllabus includes topics of self-esteem, fair play, and teamwork. It also expands the content to incorporate educational gymnastics, swimming, and dance.

Standards 1 and 2

The Colorado MCS and the Singapore Physical Education Syllabus have some similarities in emphasis at standards 1 and 2, but they are mostly different at standard 1. Each document addresses skills and fitness. The Singapore Physical Education Syllabus, however, has more breadth at standard 2, by including recreation, educational gymnastics, and swimming. It also provides a more comprehensive rationale that outlines the purpose of the Physical Education Syllabus.

Standard 3

The Colorado MCS and the Singapore Physical Education Syllabus are similar in emphasis at standard 3, although the latter has greater breadth. The Singapore Physical Education Syllabus learning objective 4 is similar to Colorado MCS standard 3. Nevertheless, knowledge for fitness and skills are incorporated into each relevant standard, instead of into a “knowledge” standard, like the Colorado MCS does with standard 3. The six objectives of the Singapore Physical Education Syllabus underscore the greater breadth it covers, by outlining additional topics such as fundamental movement, educational gymnastics, dance, games, health and fitness management, athletics, and swimming.

Grade Spans

The Singapore Physical Education Syllabus Primary 2 stage, which extends only to grade 2, is similar to the Colorado MCS at grade span K–4. Each document focuses on gross motor and movement skills. The Singapore Physical Education Syllabus, however, separates the K–4 grade span into 2 stages. It provides additional expected learning outcomes for grades 3–4 as well. This allows it to emphasize self-esteem, fair play, teamwork, and safety. As a result, the Singapore Physical Education Syllabus has greater breadth at this grade span than the Colorado MCS.

The Singapore Health Education Syllabus addresses a range of health topics at this grade span, including an understanding that good health habits will contribute to healthy growth, exhibiting good health habits, expressing and managing emotions appropriately, exhibiting behavior and attitudes that show consideration for others, practicing safe behavior that will protect themselves and others, understanding the relationship between

health and the environment, and demonstrating an understanding of the students' roles and responsibilities in caring for the environment.

The Singapore Physical Education Syllabus Primary 6 stage is similar to the Colorado MCS grade span 5–8. Each document focuses upon team, individual, and small-group activities. The Singapore Physical Education Syllabus provides a greater detail and emphasis at the grade span. Also, by separating the grade span into 2 key stages (Primary 6 and Secondary 2), it increases the breadth and depth of the content. Unlike the Colorado MCS, it addresses the themes of self-esteem, teamwork, and safety at the grade span.

The Upper Primary level of the Singapore Health Education Syllabus addresses the following themes: physical health, environment and your health, and emotional and psychological health. It provides a sound platform from which to formulate an effective Health Education framework. It is a health framework, which seeks to not only “provide students with the knowledge and skills to empower them to take care of their own health, [but also to take care of] the health of others and the environment around them.”¹⁰

The Singapore Physical Education Syllabus Secondary 4/5 stage is similar to the Colorado MCS grade span 9–12. Each document focuses upon team, individual, and small group activities. Each also increases emphasis on self-direction and understanding of fitness from the earlier grade spans. The Singapore Physical Education Syllabus is mainly different from the Colorado MCS in its emphasis on pre-university content and skills. The pre-university 2/3 Stage broadens the role and purpose of physical education into mastery, empowerment, and leadership. It also emphasizes self-esteem, fair play, teamwork, and safety.

Wording/Specificity

With regard to wording and specificity there is greater detail and specificity in the Singapore Physical Education Syllabus. It provides attainable and rigorous steps and clear objectives that give broad rationale for why physical education is taught.

¹⁰ *Singapore Health Education Syllabus*, p. 1.

Review of Colorado’s Physical Education Standards for 21st Century Skills and Abilities and Postsecondary and Workforce Readiness

As described in the Methodology section of this report, analysts analyzed Colorado’s draft 21st Century Skills and Abilities (21st Century Skills) and definition of Postsecondary and Workforce Readiness (PWR Skills) to determine the degree to which Colorado’s MCS contain the skills described in those draft documents. Findings from those analyses are presented below.

Physical Education Model Content Standards and the 21st Century Skills and Abilities

Critical thinking and reasoning

Critical thinking and reasoning is rated as Partially across the grade spans in standards 1 and 3, and No across the grade spans in standard 2. Physical education, by its emphasis on individual, pair, small-group, and large-group activities provides an avenue for critical thinking and reasoning. Game strategy, teamwork, and group dynamics, rely on critical thinking and reasoning during a dynamic game environment. The skills can be integrated into the standards at all grade spans, by encouraging students to understand group dynamics, strategies, and teamwork aspects of game play.

Information literacy

Information literacy is rated as No across the grade spans at standards 1 and 2. It is rated as Partially at standard 3 across all grade spans. As the MCS are currently written, information literacy is not well articulated in standards 1 and 2; it is addressed at the standard level but not within the grade span bullets. Other avenues for information literacy could be biomechanics, physiology, developing and analyzing fitness routines, as well as other work that involves reading and analyzing of statistical data.

Collaboration

Collaboration is rated Partially for standard 1 across the grade spans and No for standards 2 and 3 across the grade spans. Collaboration is inherent in physical education. It can be integrated into the standards through an emphasis on team activities (e.g., pairs, small groups, large groups) and any activities that incorporate group dynamics.

Self-direction

Self-direction is rated Partially at standards 1 and 2 across the grade spans and No or Partially at standard 3. Many of the individual activities and work that involve setting up, participating in, and gauging individual fitness programs incorporate the skill of self-direction.

Invention

Invention is rated as Partially at standard 1 across the grade spans, No or Partially at standard 2 in the grade spans, and Partially at standard 3 across the grade spans. Game invention, strategy, dance sequence, and any exploratory activity promote invention in physical education. Physical education promotes and encourages the development of these skills through an environment that the students feel is “real,” authentic, meaningful and understandable.

Physical Education Model Content Standards and the Postsecondary and Workforce Readiness Skills

Application of reading, writing, and computing skills with minimal remediation or training or training

Application of reading, writing, and computing skills is rated as No across the standards. Biomechanics, physiology, skill development theory, and fitness theories could be introduced into the standards to address reading, writing and computing skills.

Logical reasoning and argumentation abilities

Logical reasoning and argumentation abilities are rated as No at standards 1, 2, and Partially at standard 3. They appear at the standard level in standards 1 and 2, but not within the grade span bullets. More explicit reference to logical reasoning and argumentation abilities (e.g. understanding fitness theories, biomechanics) within the grade span bullets would fully introduce the skills into the standards.

Identification and solving of problems

Identification and solving of problems is rated No at standards 1 and 2, and Partially at standard 3. Identification and solving of problems skills can be introduced into the standards with the inclusion of game development, game strategies, and fitness theories.

Information management skills

Information management skills are rated as No at standards 1, 2, and Partially at standard 3. They appear at the standard level in standards 1 and 2, but not within the grade span bullets. More explicit reference to information management skills (e.g., fitness routines and analysis of fitness data) within the grade span bullets would fully introduce the skills into the standards.

Human relation skills

Human relation skills are rated Partially at standard 1 and 3, and No at standard 2. Human relation skills can be introduced into the standards with the inclusion of teamwork, team development, encouragement and motivation, and leadership and fellowship.

Analysis and interpretation skills

Analysis and interpretation skills are rated as Partially at standards 1, 2, and 3. They appear at the standard level in the standards, but are not well articulated within the grade span bullets. Analysis and interpretation skills could be introduced into the standards with the inclusion of fitness routines, programs, and analyzing workout data.

Recommendations

This section contains specific recommendations from the WestEd reviews, organized by the components of the analysis.

Internal Quality Review of Colorado's Physical Education Model Content Standards

The CDE may want to consider implementing the following recommendations, where appropriate:

- Provide articulation of expected physical education knowledge and skills at each grade level rather than at grade spans.
- Incorporate knowledge required for Skill Development (standard 1) and Fitness (standard 2) into each standard as opposed to being included in a “knowledge” standard (standard 3).
- Develop a clearer organization that coherently guides educators from rationale to standards, benchmarks, and grade span bullets.

External Referent Review for Physical Education

- Incorporate additional personal and social content into the Colorado MCS, such as:
 - Self-esteem, teamwork (North Carolina Standard Course of Study, Healthful Living Performance Standard Course of Study & Singapore Physical Education Syllabus)
 - Personal choice/decision making (North Carolina Standard Course of Study, Healthful Living Performance Standard Course of Study & Singapore Education Syllabus)
 - Diversity (Finland's National Core Curriculum)
 - Fair play (Finland's National Core Curriculum)
- Expand the content areas for standard 1 to include additional areas, such as:
 - Recreation (Finland's National Core Curriculum)
 - Outdoor education (Finland's National Core Curriculum)
- Incorporate Health into the Colorado MCS for physical education. A thorough example of a broad and detailed Health program is the *Massachusetts Comprehensive Health Curriculum Framework*.

Suggestions for consideration of additional external referents

Both of the suggestions below cover many of the points outlined in the physical education external referent review. In particular they cover the social and emotional aspects of physical education (or PE Health and Personal Development, as it is termed in New South Wales). They are grade level specific or have narrow grade-spans that outline specific objectives, benchmarks, and outcomes.

Personal Development, Health and Physical Education (PDHPE)
NSW Department of Education and Training, Australia

The PDHPE contains a comprehensive curriculum of standards that have a broad view of physical fitness, focusing on areas of physical, mental, health, spiritual, and social fitness. The standards are organized into knowledge and skills strands to address the areas.

K–6 content or knowledge strands

- Active Lifestyle
- Dance
- Gymnastics
- Growth and Development
- Games and Sports
- Interpersonal Relationships
- Personal Health Choices
- Safe Living

K–6 key skills

- Communicating
- Decision Making
- Interacting
- Moving
- Problem Solving

7–10 strands

- Self and relationships
- Movement and skill performance
- Individual and community health
- Lifelong physical activity

National Standards for Physical Education
National Association for Sport and Physical Education (NASPE)

The *National Standards for Physical Education* provide a framework of six standards for physical fitness, appreciation of physical activities, and social interaction.

Standard 1: Demonstrates competency in motor skills and movement patterns needed to perform a variety of physical activities.

Standard 2: Demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities.

Standard 3: Participates regularly in physical activity.

Standard 4: Achieves and maintains a health-enhancing level of physical fitness.

Standard 5: Exhibits responsible personal and social behavior that respects self and others in physical activity settings.

Standard 6: Values physical activity for health, enjoyment, challenge, self-expression, and/or social interaction.

Recommendations from the Review of 21st Century Skills and Abilities and Postsecondary and Workforce Readiness

Because of the interconnectedness of the findings and recommendations related to the 21st Century Skills and Abilities and Postsecondary and Workforce Readiness definition, recommendations related to the 21st Century and PWR skills are presented together in the Findings section of this report.