Research Article

Using Whole School Cluster Grouping to Differentiate Instruction More Effectively in Elementary Schools: A Guide for Administrators and Teachers

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Abstract

Given the wide range of ability (academic, linguistic and cultural) in classrooms differentiated instruction is often difficult to manage. District and building level leadership can play an important role by providing the vision and support needed to implement Whole School Cluster Grouping (WSCG), the innovative scheduling approach described in this paper. This paper describes the wide variation in grouping practices across schools and the challenges that continue to exist when differentiated instruction is not managed with fidelity. It then describes how WSCG, a scheduling approach that was developed to serve gifted students, can be used to provide the "good stuff" to all students. Finally, it presents a three step process, with illustrative examples, that administrators and teachers can use to identify, manage, and evaluate the effectiveness of the approach.

Key Words

leadership, scheduling, grouping, differentiated instruction, elementary school

Ever since the demise of the one room schoolhouse educators have grappled with the best way to group students for effective teaching and learning. Even though learners progressed at varying rates administrators across the globe continue to group students by chronological age and grade level. In the United States students with exceptionalities are either evenly assigned to different classes to maintain a heterogeneous mix or grouped together because of labels that assume they share similar abilities. Because neither approach is ideal district and building administrators still have to identify the best way to harness the benefits of like ability grouping while maintaining a culture of learning that supports diversity.

This paper recommends that the Whole School Cluster Grouping approach (WSCG), where all students are assigned with some of their intellectual peers (clusters), yet still in a classroom that mirrors some of the variance present in the whole grade level, should be used to differentiate more effectively in elementary classrooms. The term WSCG has been used to distinguish it from the work of Gentry and Mann's (2008) *Total School Cluster Grouping* and Winebrenner and Brulles's (2009) *Schoolwide Cluster Grouping*, which have many similarities.

Rather than distinguish between the two approaches, it builds on the similarities and describes how building level leadership teams can work together to implement this approach. To provide context, the paper begins with a brief overview of popular grouping practices and how differentiated instruction is provided when like or varied ability grouping is employed. It then describes the origin of WSCG, which was initially devised to meet the needs of gifted students. It then outlines how teams that include administrators, teachers, counselors, Title I instructors, and gifted support teachers can work together to create, manage and sustain cluster classrooms that support a higher level of differentiated instruction. It concludes with a description of how teams can evaluate the effectiveness of WSCG.

Considering Alternatives to Popular Grouping Practices: A Call to Action

While teachers in the United States are still responsible for making most of the decisions in their classrooms, administrators often decide initial student placement.

As soon as the population of a particular grade level reaches a tipping point with more than one section, administrators are faced with the decision of how to assign students in a way that will allow for the highest level of student success. Should classrooms be balanced so that all ability levels are represented, reducing the time that exceptional students can work with intellectual peers? Should classrooms include students who have been ranked in some way and grouped by similar abilities, resulting in some classes with a concentration of average students, others with highly able students, and still others with struggling students? If so, for how long? Should they be grouped together, all the time in every classroom, or grouped together some of the time (core) and then intermingled with their age-mate peers for classes like physical education or music? Grouping practices vary from school to school based on answers to these questions.

Given the wide variation in grouping practices across schools (Collins & Gan, 2013) it is important that district and school leaders evaluate the benefits and weakness of each approach and the extent to which consistency or autonomy should be given to building leaders across individual districts. While the former

could limit innovation, the latter could result in a backlash from parents who perceive one way is better than the other.

The literature on the benefits of like ability grouping is conflicted (Kulik & Kulik, 1984; Rogers, 1991; Slavin, 1986). Kulik and Kulik's work (1984) suggests that like-ability grouping supports gifted learners without adversely affecting the rest of the students. Slavin's (1986) synthesis of the literature, two years later, contradicted this work and suggested minimal and even negative improvement on academic achievement for whole classroom like-ability groups. Several years later Rogers' (1991) study of high ability learners revealed an increased effect size for achievement, as well as increase in positive self-concept, when grouped together for sustained periods.

Varied-ability grouping at the elementary level is supported in the literature as a viable grouping strategy that supports student achievement. With the release of No Child Left Behind in 1991 varied-ability grouping increased in popularity. It was presumed that this approach would reduce the growing achievement gap, a phenomenon that was emerging not only for students identified with a disability, but also with students from diverse backgrounds. Lou, Abrami, Spence, Poulsen, Chambers and Apollonia's meta-analysis of twelve studies (1996) shows that while student achievement overall was slightly higher for some homogeneous classrooms over heterogeneous, it was not the case in all studies and for all subgroups of students. Slonaker, a great proponent of varied-ability grouping, (2013) supports the elimination of "low level" math classrooms, which negatively affect historically underrepresented populations and are often placed in like-ability classrooms.

Informed by the literature described above, and the benefits and disadvantages outlined in Table 1, school administrators in the United States, over the last several decades, have grouped students either by like-ability or varied-ability, at the start of the school year.

Table 1

Benefits and Disadvantages of Like and Varied-Ability Grouping in Elementary Classrooms

Like-Ability Classroom		**Varied-Ability Classroom**	
Benefits	*Disadvantages*	*Benefits*	*Disadvantages*
Promotes whole class instruction, supporting a guaranteed and viable curriculum	Lack of Academic role models in lower ability classroom	Academic Role Models for struggling students	Varied sizes of within-class groups may make differentiation difficult to accomplish
Resources easier and more efficient to schedule	Sets up or maintains an achievement gap, teachers may have lower expectations for classes of lower ability	Microcosm of grade level range, providing broader picture of abilities to inform teacher expectations	Limits social interaction with like-ability peers when small numbers of like-ability peers exist
Long Term acceleration	Does not take into account a student's prior knowledge, assumes all learning is new	Balanced Abilities, more normal distribution	Acceleration is difficult to manage
Minimizes planning time for teacher	Less variability for social interaction over time	Supports Between Grade Grouping	Increases planning for the teacher
Allows students to work with intellectual peers	Sets up a potentially tracked secondary experience	Supports Within Class Grouping	Wide range of abilities, sometimes results in teaching to the middle

District leaders need to shift away from scheduling approaches that produce a "tracking effect" (Collins & Gan, 2013), which can be detrimental to student success (Betts & Shkolnik , 2000, Lavrijsen & Nicaise, 2016, Slonaker 2014,) in favor of approaches like WSCG, described in the section that follows, that align more closely with the following ELCC Standard Elements that were developed to guide the preparation and practice of district leaders:

> ELCC 2.1: Candidates understand and can advocate, nurture, and sustain a district culture and instructional program conducive to student learning through collaboration, trust, and a personalized learning environment with high expectations for students.
>
> ELCC 2.2: Candidates understand and can create and evaluate a comprehensive rigorous, and coherent curricular and instructional district program.
>
> ELCC 5.1: Candidates understand and can act with integrity and fairness to ensure a district system of accountability for every student's academic and social success. ELCC 5.5: Candidates understand and can promote social justice within the district to ensure individual student needs inform all aspects of schooling. (National Policy Board for Educational Standards, 2011)

WSCG is cost effective because the composition of classes can change without an investment of additional funds. District leaders who are committed to promoting academic and social success for all students could begin by identifying and supporting progressive building school leaders who are willing to pilot the approach. After evaluating the effectiveness of the approach they could consider deepen the impact of the innovative approach by implementing it across the district for systemic change.

WSCG: Understanding, Managing and Sustaining Cluster Classrooms

There is evidence to show that differentiation, while long hailed as beneficial practice for student learning, is difficult to manage in the elementary classroom when a wide range of abilities are present. This has prompted a large majority of administrators in the United States to experiment with two options: (1) grouping students by ability and providing teachers with training on how to work with specific like-ability groups or (2) varying the ability across all the classrooms and instructing teachers on how to differentiate instruction for all ability groups. WSCG marries both grouping practices by maintaining some diversity within a narrowed range.

Additionally, it gives administrators an opportunity to shift from grouping students by ability and aptitude data, to using achievement data that better informs instructional practice.

Understanding evolution of WSCG

There is evidence to show that successful implementation of differentiated instruction falls short, especially in terms of meeting the needs of high ability learners (Missett, Brunner, Callahan, Moon & Azano, 2014).

Students who are gifted may find themselves a "party of one or few" among the class, which decreases the likelihood teachers will make the investment in planning that is necessary. This, according to Tieso (2003),

results in independent exploration or low level drill and practice type activities. To minimize marginalization of the gifted learner administrators in the United States have experimented with different regrouping practices. The most prevalent is a pull-out service, a type of short term between-grade grouping option. It temporarily relocates gifted students during regular instructional time to engage in enrichment activities.

Administrators have also scheduled gifted learners together in a classroom for increased opportunities to work collaboratively during within class grouping. This practice increases the likelihood of implementing differentiation for the gifted learners and is referred to as cluster grouping.

Gates (2011) and Rogers (2007) describe a process where administrators group students of the highest ability (often just students identified as gifted), which could be a few students or a whole class, depending upon the percentage of students identified as gifted in a particular grade level. If the cluster was small enough, they could be paired with either above average ability students or a more heterogeneous group. Bear (1999) and Brulles (2005) found that either way proved successful for non-gifted learners when teachers received targeted professional development to implement strategies that would allow for acceleration and/or enrichment.

There is evidence to show that creating classes with lower levels of dispersion of scores or ability improves achievement outcomes for students (Collins & Gan, 2013). Schools that employ WSCG, minimize the occurrence of stratified classes by strategically scheduling clusters (groups) of students together to avoid a total like-ability grouped classroom. Teachers can plan for differentiated instruction more effectively because they are focusing on fewer ability groups than typical in a traditional classroom. This approach eliminates the perceived social status or stigma of being grouped solely by label or similar ability and supports learning across multiple ability levels (Gentry & Mann, 2008; Winebrenner & Brulles, 2009).

Gates (2011) and Necciai (2013) support classrooms with a narrowed range without creating classrooms that are predominantly high or low ability cluster. In a WSCG model administrators facilitate a process where all students are assigned to a cluster at the end of the year that reflects their achievement level.

Table 2 illustrates how this can be done in a school with six sections of second grade; with each section accommodating 20 students. Cluster 5 represents the highest ability learner and 1 represents the lowest ability learners.

As evident from Table 2, even though the 120 second grade students have been grouped into five different ability group clusters (1, 2, 3, 4, & 5) each section/room includes only 3 of the 5 groups. The cluster with the highest population across the grade level, Cluster 3, is a part of every classroom. Each section/room has only one of the top two clusters (4 & 5) and one of the bottom two (1 & 2) clusters. Students of above average ability (4) are dispersed among classrooms without the highest ability level (1, 2, & 3) to work with like ability peers, as well as interact with lower achieving students. Low ability clusters (1 & 2) are interspersed with average (3) and above average clusters (4).

Table 2

WSCG: Sample Breakdown

Cluster/ Group	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Total Students
5	6	4	0	0	0	0	10
4	0	0	4	6	4	4	18
3	9	10	12	10	10	8	59
2	5	6	4	4	0	0	19
1	0	0	0	0	6	8	14
	20	20	20	20	20	20	120

Note: Adapted from "The Cluster Grouping Handbook," by S. Winebrenner & D. Brulles, 2009, p. 14, Minneapolis, MN: Free Spirit Publishing.

Managing WSCG: Using a Three-Step Process to Create Cluster Classrooms

Based on the work of Gentry and Mann (2008), Gentry, Paul, McIntosh, Fugate and Jen (2014) and Winebrenner and Brulles (2009), who have contributed significantly to our understanding of the process, administrators can use a three step process. See Figure 1) described below to plan for WSCG.

Figure 1. Managing WSCG: using a three-step process to create cluster classrooms

Step 1: Administrators determine cluster identification

Cluster identification can be done in many different ways. Administrators can use the example presented in Table 3 to guide their thinking about cluster identification. Identification is often based on primary and secondary characteristics, which could be operationalized as students' abilities and academic performance.

Administrators can begin the process by identifying key pieces of data in both math and literacy at each grade level that will help inform cluster placement. The data must be discriminating enough to distinguish among the five ability levels. It is recommended that the data be a combination of benchmark and summative data, using diagnostic data only if necessary because of the time it takes to administer, and establish consistency across a district with multiple elementary buildings.

Administrators begin by defining the clusters that contain students who are the furthest outliers from the grade level mean.

As evident from Table 3 Cluster 5 includes students with the highest ability, strong in both math and literacy, and are most often likely to be gifted. Cluster 1 includes students with the most discrepant below grade level abilities in both math and literacy. This group also includes many students who may be identified with special needs (though not necessarily all).

By limiting the classrooms that have Clusters 1 and 5, often each about ten percent of the population, the administrator can allocate resources more efficiently to assure both clusters are getting additional support beyond the classroom teacher from specialized personnel.

Table 3

Cluster Identification Figure: An Example

Category	Primary Characteristics	Secondary Characteristics
Cluster 1: Far Below Average (M) and Below Average (R)	Struggling in math *and* reading	• Often students identified with a disability and have most intense needs • Makes little progress, significant skill deficits in BOTH areas • Struggles overall with work ethic, self-discipline, task commitment, and/or study skills
Cluster 2: Below Average (M) or Below Average (R)	Struggling in math *or* reading	• Few students identified with a disability but have less intense needs • Makes progress, skill deficits significant in ONE area • Struggles overall with work ethic, self-discipline, task commitment, and/or study skills
Cluster 3: Average	On Grade level. Making good annual progress in line with the standards	• Likely not to include identified students • Makes good progress, struggles at times, but is capable of "catching back up" when setbacks occur with support from teachers, parents • Somewhat consistent in work ethic, self-discipline, task commitment, and/or study skills
Cluster 4: Above Average (M) or Above Average (R)	Strong in math *or* reading	• Few students identified as gifted but with less intense needs • Makes advanced progress in ONE subject Area • Strong independent learner, high levels of task commitment, strong study skills, flexible thinker, makes connections among content areas, problem-solver
Cluster 5: Highest	Strong in math *and* reading	• Often students identified as gifted and have most intense needs • Makes advanced progress in BOTH subject areas • Strong independent learner, high levels of task commitment, strong study skills, flexible thinker, makes connections among content areas, problem-solver

Note: Based on the "Total school cluster grouping and differentiation," by M. Gentry, K.A. Paul, J. McIntosh, C.M. Fugate, & E. Jen, 2014, p. 32, Waco, TX: Prufrock Press.

As described above in Table 3, Clusters 2 and 4 represent a slightly larger portion of the grade level, and students may have more variance between their abilities in math and literacy. Cluster 4 is made up of students who are above average in either math or literacy, while Cluster 2 consists of students who are somewhat discrepant below grade level in either math or literacy.

It is helpful to document the areas that may be strength or a weakness if the grade level will have multiple sections comprised of Clusters 2 or 4. For example, it may be beneficial for a Cluster 4 student who has a relative strength in literacy to be clustered with other students who share this strength, as opposed to the Cluster 4 students who have a relative strength in math.

In the sample breakdown above, Table 2, there are four classrooms that have Cluster 2 students. To assist in planning for differentiation, it may be prudent to schedule the Cluster 2 students who have a designated weakness in math together and enlist some help, if available, of additional personnel. The end result is a strategic placement of students so that they can get both the benefits of a varied-ability classroom, and concentrated support that may be possible in a like-ability classroom.

Finally, the largest population of students (see Table 2) at any given grade level are the students of average ability from Cluster 3, which will be part of every classroom. The current high quality grade level curriculum and instruction is most likely the best fit for these students' needs.

Regardless of entering cluster number for any student, teachers practice consistent pre-assessment to monitor background knowledge and understanding on a unit by unit basis, so a student is not limited by an entering achievement level.

Administrators who require that pre-assessments align with unit objectives will allow teachers to determine if students need additional challenge or support in literacy or math throughout the year; this facilitates movement of students in and out of small groups for any given unit or task assignment.

Step 2: Teachers place students into cluster

Once administrators have defined the characteristics of students to be included in each cluster and identified extant data that can be used for decision making, it is time to engage teachers in the student placement process. This can be done in isolation by individual teachers or by a placement and scheduling team, using a collaborative grade level process. Either way, teachers assign students a cluster number based primarily on the characteristics defined for that cluster (see example presented in Table 3) as well as their professional opinion.

Next, the team considers extant datasets for literacy and math and, with administrative guidance, interprets how that data guides student placement. Ideally student data should support initial teacher placement, but if it does not then other factors should be discussed. If a teacher rates a student higher than the data suggests, and the choice is average, above average, or high above average, placement should be weighted more by teacher perception. When considering a low or below average placement (and data conflicts), the recommendation is to place the student where he/she is most likely to get support if needed. Placement within a cluster is not permanent, it can change annually, allowing student growth and maturation to occur.

Step 3: Scheduling teams create cluster classrooms

Elementary scheduling involves more than just classroom placement of students. A cadre of personnel is needed to provide supports to students with specialized needs (English Language learners, students in need of Title I services, Speech and Language support, etc.). Therefore, students' needs can be met more fully when building leadership teams drive the process.

Administrators may consider adding other specialists to the process, especially if they have access to information that will aid potential mid-year identifications (students for whom specially designed instruction is suddenly deemed necessary requiring additional services and/or personnel) or move-ins (new students). For example, administrators who include Counselors, Title I Instructors, and Gifted Support teachers, etc. can gain critical insight as to students who may not be identified yet, but may need services later in the following year. Teams that analyze move-in trends can anticipate "spaces" for incoming students that will maintain the integrity of the clustering.

One goal of WSCG is to assure student access to ability peer groups in each class. When dispersing clusters among the classrooms, careful consideration is given first to rooms with Clusters 1 and 5, and then the rest of the grade level is planned. In the example provided earlier (see Table 2) the administrator decides that the 120 students will be placed in six classrooms, with 20 students per classroom. In order to maintain strategic grouping there are only three possible cluster configurations. Table 4 below describes the possibilities. The first Classroom Type will have the lowest ability students, option two is a classroom with the highest ability cluster; and the final option, Classroom Type 3, has neither the highest or lowest ability group.

Table 4

Cluster Configurations

Classroom Type	Clusters
Type 1: Outlier Group with the Lowest Ability Level	**1**, 3, 4
Type 2: Outlier Group with the Highest Ability Level	2, 3, **5**
Type 3: No Outlier Groups	2, 3, 4

The number of sections that will have a Cluster 1 or 5 group will be depend upon the total number of students in that cluster in a grade level and/or the number of classrooms.

Table 5 below identifies the type of classroom configuration found in each room. Winebrenner and Brulles (2009) suggest a 3 to7 rule. As per this rule, if there are less than three students of a cluster, they are all placed together, if there are more than seven they can be assigned to two classes which is illustrated in Table 5 for Rooms 1 and 2. Gentry, et.al (2014) suggest an alternative approach. They recommend that administrators use percentages to guide the number of sections include Clusters 1 or 5.

For example, in a grade level that has five sections, one classroom might have all of the highest cluster and one section would have all of the lowest cluster. In their version of the model, cluster groups 1 and 5 within a classroom can be higher in number.

Table 5

Sample Breakdown with Cluster Configuration

Cluster	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Total students
5	6	4	0	0	0	0	10
4	0	0	4	6	4	4	18
3	9	10	12	10	10	8	59
2	5	6	4	4	0	0	19
1	0	0	0	0	6	8	14
	20	20	20	20	20	20	120
	Type 2	Type 2	Type 3	Type 3	Type 1	Type 1	
	2. 3. **5**	2. 3. **5**	2. 3. 4	2. 3. 4	**1**. 3. 4	**1**. 3. 4	

Note: Adapted from "The Cluster Grouping Handbook," by S. Winebrenner & D. Brulles, 2009, p. 14, Minneapolis, MN: Free Spirit Publishing.

Once Clusters 1 and 5 are placed, administrators and teacher teams determine if further delineations of Clusters 2 and 4 are possible or necessary.

When grade levels are larger, and allow for more classes that have Clusters 2 and 4, considering the predominant strength or weakness may help group students more effectively for differentiated instruction and allow for additional support or challenge where it is needed the most (math vs. literacy). If numbers are too small for multiple sections, grouping by cluster number alone is recommended.

Finalizing an individual student's placement in classrooms and communicating how this is accomplished should be done with care. Administrators and teachers may transfer students between classrooms under special circumstances, based on behavior concerns or to provide access to related services.

To ensure that each classroom retains the right mix of students in the different clusters, changes should be made only between students who share the same cluster numbers. While it is acceptable to provide parents with information about how classrooms are scheduled, scholars recommend that administrators and teachers emphasize the temporal nature and purpose for the clusters number (Gentry et.al, 2014; Winebrenner & Brulles, 2009).

If administrators entertain requests from parents, they should only consider changes that will not adversely affect the diversity in each classroom. Administrators who have experimented successfully with WSCG recommend new students be assured temporary placement on the first day of attendance, but finalized only after data has been collected, if necessary, and analyzed.

Cluster determination is used for scheduling, and, once completed it should be eliminated from the record. Subsequently, teachers should use more current and frequently collected data to focus on where students are functioning in relation to current unit or lesson level objectives, in order to support differentiation for all levels of learners.

Sustaining WSCG: supporting students and teachers

While differentiation has been a mainstay of professional development sessions, implementation is often difficult. Tomlinson (2010) identified five non-negotiables that must be part of any successful differentiated classroom: supportive learning environment, high quality core curriculum, on-going formative assessment, flexible grouping, and respectful tasks. This does not change with WSCG, but is actually made easier. Brulles and Winebrenner (2009) and Gentry et.al (2014) indicate that teachers in schools where WSCG is employed, can focus on the five non-negotiables more easily because of decreased ability range. Additionally, with a narrowed range, administrators can provide teachers with professional development that helps them to focus on the specific techniques that support the learners in their classrooms.

For example, they can provide teachers with professional development on strategies like Most Difficult First or Alternative Tasks that increase complexity if they have Cluster 4 or 5 students in their classrooms (Brulles, cited in Azzam, 2016). Similarly, they can provide teachers who have Cluster 1 or 2 students with professional development on targeted interventions like direct and explicit instruction in more discrete literacy skills.

In the long term, administrators should provide teachers with training on how to work with all students, regardless of the types of clusters they have been assigned (Brulles 2005; Gentry & Owen, 1999; Necciai, 2013).

District and School Leaders' Role in Evaluating Effectiveness of WSCG

The goal of WSCG is to maximize learning for all students while minimizing or even eliminating any negative consequences. While exceptional students still may require additional supports, the process for identifying them is time consuming, a strain on available resources, and can result in non-identification. Without identification, potentially exceptional students are prevented access to additional scaffolds, supports or challenge.

With WSCG, schools are no longer saving the "good stuff" for just identified students. Instead teachers provide rich, varied, and supported learning opportunities that promote a growth mindset in all students. For continuous improvement district and school administrators and teachers may consider partnering with universities to design evaluative action research that focusses on the following:

- Developing systematic procedures to evaluate the composition of clusters annually. Necciai's (2013) four-year study which focused on teacher perceptions involving three elementary schools in a large, urban district confirmed that the number of high and above average learners actually increased while lower ability students decreased after revisiting cluster placement. Additionally, standardized tests revealed overall student growth.

- Monitoring teacher practices by establishing a concrete set of expectations for classroom management and lesson plan design. Monitoring implementation encourages teachers to collaboratively plan, individually self-reflect, and offer peer-to-peer observations.

- Designing and implementing action research or experimental studies to determine if student achievement is being enhanced. Using a case study approach and action research involving 3,716 students, Brulles et.al (2012) and Peters, Brulles, and Saunders (2012) found that when cluster grouping was employed growth was similar for gifted and non-gifted math students. Substantial pre and post-test math results showed increases for all grades studied (2-8) and increases were realized whether students were placed in a class with a gifted cluster or not.

Conclusion

Popular grouping practices in the United States have evolved over the last few decades as differentiated instruction became more popular.

This paper describes how WSCG, which began as a strategy to support gifted students, can used to differentiate instruction across a wide range of ability groups in a thoughtful and purposeful manner.

The three step process, described in this paper, helps to reduce the range of diversity in each class by limiting it to three clusters, as opposed to five.

In addition to eliminating the perceived social status or stigma of being grouped solely by label or similar ability it supports learning across multiple ability levels.

More importantly, the narrower range provides students in each classroom with access to academic, linguistic and cultural diversity. It also it makes it easier for teachers to manage differentiated instruction.

The success of this scheduling approach will rest on administrators and teachers' ability

to work together to identify, manage, and evaluate the effectiveness of cluster grouping on an ongoing basis. Continue improvement can be built into the process by partnering with universities to design evaluative and/or action research that evaluates the outcomes of cluster grouping for all students.

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