Pattern Recursion

Considering only the primes 2, 3, 5, & 7
Start at the symmetry point, and trace factors back. The prime pattern recurs in each of these sequences

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Starting poin	G=	104	S=	52	Basic Equivalents		
Start	P	2	3	2*5	7		
	a1	52	51	50	49	48 ..	43
	a2	52	53	54	55	56 ..	61
	P	2		3	5	7	hole

Reversals

P	2		3	5	7	..		<- prime factors in falling sequence
a1	158	157	156	155	154	..	**149**	<- falling sequence
a2	158	159	160	161	162		167	<- rising sequence
P	2	3	2*5	7			hole	<- prime factors in rising sequence

can't flip 2

	P	2	3	2	7*5			
flip 5	a1	178	177	176	175	174	..	169
42	a2	178	179	180	181	182	..	187
	P	2		3*5		7		hole

	P	2		3*5		7		
	a1	32	31	30	29	28	..	23
	a2	32	33	34	35	36	..	41
	P	2	3	2	7*5			hole

	P	2	3	2*5		7		
flip 7	a1	172	171	170	169	168	..	163
30	a2	172	173	174	175	176	..	181
	P	2		3	5*7			hole

P	2		3	5*7				
a1	38	37	36	35	34	..	29	
a2	38	39	40	41	42	..	47	
P	2	3	2*5		7		hole	

flip 3	P	2		2*5*3	7			
70	a1	122	121	120	119	118	..	113
	a2	122	123	124	125	126	..	131
	P	2	3		5	7		hole

P	2	3		5	7			
a1	88	87	86	85	84	..	79	
a2	88	89	90	91	92	..	97	
P	2		2*5*3	7			hole	

The green column separates sequences with the same pattern simply flipped between the rising and falling patterns.

This color codes where the prime has been flipped to the opposite side but holds the same relative position to the point of symmetry.

This color codes where a hole containing no critical prime factors (2, 3, 5, or 7) exists in the sequence.

Dn Equivalents For more explanation see: http://conceptualmath.org/musings/goldbachmp.htm

For the D2 equivalents, we find the same prime factor masking sequence, but stepping by 2 instead of 1.

Since we step by 2 starting on an odd symmetry point, 2 will not occur as a factor. We color code this. Other

n=																		
2	P			3	5	7				P	2		3	5	7			
209	a1	209	207	205	203	201	..	191		a1	1	-1	-3	-5	-7	..	-17	
	a2	209	211	213	215	217	..	227		a2	1	3	5	7	9	..	19	
	P			3	5	7		hole		P	2	3	2*5	7			hole	
	P		3		7*5					P	2		3*5		7			
461	a1	41	39	37	35	33	..	23		a1	169	167	165	163	161	..	151	
	a2	41	43	45	47	49	..	59		a2	169	171	173	175	177	..	187	
	P			3*5		7		hole		P	2	3	2	7*5			hole	
	P	2	3	2*5		7				P	2		3	5*7				
449	a1	29	27	25	23	21	..	11		a1	181	179	177	175	173	..	163	
	a2	29	31	33	35	37	..	47		a2	181	183	185	187	189	..	199	
	P	2		3	5*7			hole		P	2	3	2*5		7		hole	
	P	2		2*5*3	7					P	2	3		5	7			
349	a1	139	137	135	133	131	..	121		a1	71	69	67	65	63	..	53	
	a2	139	141	143	145	147	..	157		a2	71	73	75	77	79	..	89	
	P	2	3		5	7		hole		P	2		2*5*3	7			hole	

Numbers in the color coded side bar to the left help determine where the Dn equivalents will occur. Modular arithmetic could determine them exactly

D3 Equivalents

n=																		
3	P	2	3	2*5	7					P	2		3	5	7			
226	a1	16	13	10	7	4	..	-11		a1	194	191	188	185	182	..	167	
	a2	16	19	22	25	28	..	43		a2	194	197	200	203	206	..	221	
	P	2		2*3	5	7		hole		P	2	3	2*5	7			hole	
	P	2	3	2	7*5					P	2		3*5		7			
604	a1	184	181	178	175	172	..	157		a1	26	23	20	17	14	..	-1	
	a2	184	187	190	193	196	..	211		a2	26	29	32	35	38	..	53	
	P	2		3*5		7		hole		P	2	3	2	7*5			hole	
	P	2	3	2*5		7				P	2		3	5*7				
586	a1	166	163	160	157	154	..	139		a1	44	41	38	35	32	..	17	
	a2	166	169	172	175	178	..	193		a2	44	47	50	53	56	..	71	
	P	2		3	5*7			hole		P	2	3	2*5		7		hole	
	P	2		2*5*3	7					P	2	3		5	7			
436	a1	16	13	10	7	4	..	-11		a1	194	191	188	185	182	..	167	
	a2	16	19	22	25	28	..	43		a2	194	197	200	203	206	..	221	
	P	2	3		5	7		hole		P	2		2*5*3	7			hole	

The color coded overlap here reminds us that we can't flip a prime when we are stepping by the same amount as that prime.

n=	D4 Equivalents																	
4	P		3	5	7				P	2		3	5	7				
313	a1	103	99	95	91	87	..	67	a1	107	103	99	95	91	..	71		
	a2	103	107	111	115	119	..	139	a2	107	111	115	119	123	..	143		
	P			3	5	7		hole	P	2	3	2*5	7			hole		
	P		3		7*5				P	2		3*5		7				
817	a1	187	183	179	175	171	..	151	a1	23	19	15	11	7	..	-13		
	a2	187	191	195	199	203	..	223	a2	23	27	31	35	39	..	59		
	P			3*5		7		hole	P	2	3	2	7*5			hole		
	P	2	3	2*5		7			P	2		3	5*7					
793	a1	163	159	155	151	147	..	127	a1	47	43	39	35	31	..	11		
	a2	163	167	171	175	179	..	199	a2	47	51	55	59	63	..	83		
	P	2		3	5*7			hole	P	2	3	2*5		7		hole		
	P	2		2*5*3	7				P	2	3		5	7				
593	a1	173	169	165	161	157	..	137	a1	37	33	29	25	21	..	1		
	a2	173	177	181	185	189	..	209	a2	37	41	45	49	53	..	73		
	P	2	3		5	7		hole	P	2		2*5*3	7			hole		

n=	D5 Equivalents																	
5	P		2	3	2*5	7				P	2		3	5	7			
302	a1	92	87	82	77	72	..	47		a1	118	113	108	103	98	..	73	
	a2	92	97	102	107	112	..	137		a2	118	123	128	133	138	..	163	
	P	2		2*3	5	7		hole		P	2	3	2*5	7			hole	
	P		2	3	2	7*5				P	2		3*5		7			
932	a1	92	87	82	77	72	..	47		a1	118	113	108	103	98	..	73	
	a2	92	97	102	107	112	..	137		a2	118	123	128	133	138	..	163	
	P	2		3*5		7		hole		P	2	3	2	7*5			hole	
	P		2	3	2*5		7			P	2		3	5*7				
902	a1	62	57	52	47	42	..	17		a1	148	143	138	133	128	..	103	
	a2	62	67	72	77	82	..	107		a2	148	153	158	163	168	..	193	
	P	2		3	5*7			hole		P	2	3	2*5		7		hole	
	P		2		2*5*3	7				P	2	3		5	7			
652	a1	22	17	12	7	2	..	-23		a1	188	183	178	173	168	..	143	
	a2	22	27	32	37	42	..	67		a2	188	193	198	203	208	..	233	
	P	2	3		5	7		hole		P	2		2*5*3	7			hole	

n=	D6 Equivalents																	
6	P			3	5	7				P	2		3	5	7		
347	a1	137	131	125	119	113	..	83		a1	73	67	61	55	49	..	19
	a2	137	143	149	155	161	..	191		a2	73	79	85	91	97	..	127
	P			3	5	7		hole		P	2	3	2*5	7			hole
	P			3	7*5					P	2		3*5		7		
1103	a1	53	47	41	35	29	..	-1		a1	157	151	145	139	133	..	103
	a2	53	59	65	71	77	..	107		a2	157	163	169	175	181	..	211
	P			3*5		7		hole		P	2	3	2	7*5			hole
	P	2	3	2*5		7				P	2		3	5*7			
1067	a1	17	11	5	-1	-7	..	-37		a1	193	187	181	175	169	..	139
	a2	17	23	29	35	41	..	71		a2	193	199	205	211	217	..	247
	P	2		3	5*7			hole		P	2	3	2*5		7		hole
	P	2		2*5*3	7					P	2	3		5	7		
767	a1	137	131	125	119	113	..	83		a1	73	67	61	55	49	..	19
	a2	137	143	149	155	161	..	191		a2	73	79	85	91	97	..	127
	P	2	3		5	7		hole		P	2		2*5*3	7			hole

n=	D7 Equivalents																	
7	P	2	3	2*5	7					P	2		3	5	7			
394	a1	184	177	170	163	156	..	121		a1	26	19	12	5	-2	..	-37	
	a2	184	191	198	205	212	..	247		a2	26	33	40	47	54	..	89	
	P	2		2*3	5	7		hole		P	2	3	2*5	7			hole	
	P	2	3	2	7*5					P	2		3*5		7			
1276	a1	16	9	2	-5	-12	..	-47		a1	194	187	180	173	166	..	131	
	a2	16	23	30	37	44	..	79		a2	194	201	208	215	222	..	257	
	P	2		3*5		7		hole		P	2	3	2	7*5			hole	
	P	2	3	2*5		7				P	2		3	5*7				
1234	a1	184	177	170	163	156	..	121		a1	26	19	12	5	-2	..	-37	
	a2	184	191	198	205	212	..	247		a2	26	33	40	47	54	..	89	
	P	2		3	5*7			hole		P	2	3	2*5		7		hole	
	P	2		2*5*3	7					P	2	3		5	7			
884	a1	44	37	30	23	16	..	-19		a1	166	159	152	145	138	..	103	
	a2	44	51	58	65	72	..	107		a2	166	173	180	187	194	..	229	
	P	2	3		5	7		hole		P	2		2*5*3	7			hole	

We could find Dn equivalent patterns for higher values of n, but for small numbers with a short list of critical primes (e.g.: 2, 3, 5, & 7) that would probably not be necessary.

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to demonstrate pattern recursion as a possible approach to Goldbach's